FY 2007-2010

CONFORMITY DETERMINATIONS

FOR

TRANSPORTATION IMPROVEMENT PROGRAMS, TRANSPORTATION PLANS, AND REGIONAL EMISSIONS ANALYSIS OF TRANSPORTATION PROJECTS IN NEW HAMPSHIRE'S NON-ATTAINMENT AREAS

January 10, 2007
(Released for 60 day public comment period October 6 – December 6, 2006)

PREPARED BY:
New Hampshire Department of Transportation
Bureau of Transportation Planning

IN CONJUNCTION WITH:
New Hampshire Department of Environmental Services
Southern New Hampshire Planning Commission
Nashua Regional Planning Commission
Strafford Regional Planning Commission
Rockingham Planning Commission

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INTRODUCTION

The 1990 Clean Air Act Amendments require conformity determinations of Transportation Plans and Transportation Improvement Programs (TIPs) adopted by Metropolitan Planning Organizations (MPOs) in areas that are non-attainment for particular pollutants or areas that have been re-designated as attainment areas and are under maintenance plans. Conformity determinations are also required in non-attainment areas for all transportation projects funded or approved under Title 23 or the Federal Transit Act.

The United States Environmental Protection Agency (EPA) promulgated final rules on transportation conformity procedures on November 24, 1993 (Federal Register, Vol. 58, No. 225). Each state subject to this rule is required to submit a revision to the State Implementation Plan (SIP), which contains the criteria and procedures for determining conformity in that state. New Hampshire promulgated administrative rules in October 1995 and submitted them to EPA for approval in January 1996. The administrative rules, found in Chapter Env-A 1500, Transportation Conformity, adopt certain portions of the the Federal rule relating to the consultation process by reference. Chapter Env-A 1500 has been revised in recent years to reflect changes to the Federal rules, most recently in October 2003.

This report and the analyses contained within were prepared according to the Federal rule criteria (including third set of amendments) and procedures. The consultation procedures as outlined in Chapter Env-A 1500, and approved by EPA, were followed in the preparation of this conformity determination.

In 2000, EPA promulgated rules for a revised ozone standard, creating a new, more stringent 8-hour ozone standard in lieu of the 1-hour standard. On April 15, 2004, EPA designated certain areas throughout the country as non-attainment under the new 8-hour ozone standard, effective June 15, 2004. Under the new designation New Hampshire has a single, moderate ozone non-attainment area, known as the Boston-Manchester-Portsmouth (SE) NH Non-attainment Area. This “SE NH 8-hour non-attainment area” lies within the boundaries of the previous 1-hour nonattainment areas which consisted of the Manchester Marginal, Portsmouth-Dover-Rochester Serious (known as the Seacoast Serious), and Boston-Lawrence-Worchester Eastern Massachusetts and Southern New Hampshire Serious (know as the Southern Serious) 1-hour ozone non-attainment areas. The State of New Hampshire has not yet submitted a new State Implementation Plan (SIP) for the 8-hour standard and, therefore does not yet have a mobile source emission budget for the 8-hour non-attainment area. Following established EPA guidance New Hampshire uses the following method for demonstrating conformity during this interim period:

- The former 1-hour Seacoast and Southern Serious non-attainment areas continue to utilize the 1-hour mobile source emission budgets. Emissions within the boundaries of the previous areas are evaluated and compared to the established 1 hour budget. Any “off model” emission reduction projects in the area are only included in the analysis if they take place within those towns that are within the new, smaller boundary of the 8-hour non-attainment area.
- Areas that are outside the Seacoast and Southern areas, but within the boundary of the 8-hour area demonstrate conformity using two emissions tests:
    - Build emissions are less than or equal to No Build Emissions, and
    - Build emissions are less than or equal to 2002 Baseline Emissions.

Exhibit 2 contains maps showing the boundary of the current SE NH 8-hour ozone non-attainment area, as well as a map of the former 1-hour ozone non-attainment areas, including the boundaries of the four Metropolitan Planning Organizations.

The 1-hour ozone mobile source emission budgets used in this Conformity Determination are from the “2003 Attainment Demonstration” SIP submitted to EPA in 1998 and are documented in Appendix A, and under Task 7 of this Introduction.

The FY 2007-2010 STIP and therefore the TIPs have been determined to be fiscally constrained based on projected Obligational Limits under Federal legislation and the Department’s ability to advance construct projects when funds are not available. A full description of this fiscal constraint analysis will be sent along with the final Conformity Determination to Federal Highway Administration (FHWA) and Federal Transit Administration (FTA).

APPLICABILITY

According to the Federal rule, conformity determinations are required for the adoption, acceptance or approval of a Transportation Plan or Transportation Improvement Program by an MPO or DOT. At this time, a new Statewide Transportation Improvement Program (FY 2007-2010 STIP) and respective MPO TIPs were adopted by NHDOT and the MPOs. All the MPO Transportation Plans were also adopted. The analysis contained in this document serves as a supplement to the analysis in each TIP and Plan as well as demonstrating conformity to the new 8-hour standard.

Conformity determinations are required in all non-attainment areas for transportation-related criteria pollutants. In April of 2004, EPA designating parts of four counties non-attainment for Ozone using the 8-hour standard. These counties are Hillsborough, Merrimack, Rockingham, and Strafford. This map is shown as Exhibit 2. These areas require an approved Conformity Determination. In ozone non-attainment areas, conformity must be demonstrated for volatile organic compounds (VOCs) and for nitrogen oxides (NOx).

Two cities, Nashua and Manchester, are also designated non-attainment for Carbon Monoxide (CO). Since these cities are entirely within MPO areas, conformity determinations for carbon monoxide are contained in the MPO TIP and Plan analysis.

The conformity tests required in the Federal rule must be demonstrated for the respective pollutant(s) in each non-attainment budget area in its entirety. As shown in Exhibit 2, the boundaries of the MPO areas and the non-attainment budget areas do not always match. Portions of some MPOs can be found in several non-attainment budget areas and vice versa. For this reason, NHDOT has prepared this document, which combines analyses performed by the MPOs to complete the analysis for the entire non-attainment budget area.

TASK 1: PROJECT IDENTIFICATION

The FY 2007-2010 STIP, MPO TIPs and Transportation Plans were used to identify projects to be included in the regional emissions analyses. Since the FY 2007-2010 STIP only covers the next four years, the State's Ten Year Plan and the MPO Transportation Plans were used to determine future year projects.

In addition to projects listed on the FY 2007-2010 STIP, MPO TIPs and MPO Plans, any other transportation project, which is considered regionally significant, is included in the analysis. These projects were identified through local contacts at the MPO, Regional Planning Commissions, and NHDOT District offices and following the definitions and procedures in the state transportation conformity rule (Env-A: 1501).

TASK 2: DETERMINE EXEMPT PROJECTS

Most projects in the FY 2007-2010 STIP, MPO TIPs and MPO Plans are not included in the analysis because they are exempt from conformity determinations. Exhibit 2 lists those types of projects that are considered exempt. Exhibit 2 is based on tables contained in the Federal rule. Codes for each project type have been added to Exhibit 2 for reference purposes.

Exhibit 4 contains the list of not exempt projects gathered from the FY 2007-2010 STIP, State Ten Year Plan, MPO TIPs, and MPO Plans. List of Regionally significant projects are included in the individual MPO reports (Appendices B, C, and D).

Conformity determinations are required for certain analysis years. These analysis years have been developed in consultation with New Hampshire Department of Environmental Services (NHDES), EPA and by looking at section 51.404 of the Federal Transportation Conformity rule. Projects are considered in a particular analysis year based on the expected opening year. Projects expected to be complete beyond these analysis years are not considered. In New Hampshire, analysis years are defined as follows:

OZONE NON-ATTAINMENT BUDGET AREA	CLASSIFICATION	ANALYSIS YEARS
SOUTHERN NH	SERIOUS	2007, 2009, 2017, 2026
SEACOAST	SERIOUS	2007, 2009, 2017, 2026
MANCHESTER	MARGINAL	2007, 2009, 2017, 2026
CHESHIRE COUNTY	NOT CLASSIFIED, INCOMPLETE DATA	2007, 2009, 2017, 2026

CARBON MONOXIDE (CO) NON-ATTAINMENT AREA	CLASSIFICATION	ANALYSIS YEARS
CITY OF MANCHESTER	NOT CLASSIFIED	2010, 2017, 2026
CITY OF NASHUA	NOT CLASSIFIED	2010, 2017, 2026

TASK 3: DETERMINE NO BUILD VERSUS BUILD PROJECTS

Projects, which have completed the National Environmental Policy Act (NEPA) environmental permit process, are placed in the No Build scenario for analysis. All other projects (except some projects which are built or in the process of being implemented) are analyzed as part of the Build scenario. Exhibit 4 notes which scenario each project was assigned.

TASK 4: DETERMINE NO BUILD EMISSIONS

The MPOs have incorporated all the projects considered as baseline projects (see Exhibit 4) in the appropriate analysis years. Background growth and the effects of these baseline projects are incorporated into the model calculations. Certain projects cannot be analyzed with transportation models. These projects, known as “off-model” projects are noted in their documentation. The emissions based on “off-model” calculations, were added to the model output, to calculate the total No Build emissions.

The transportation models can provide for Vehicle Miles Traveled (VMT) and speed estimates. Emission factors from the EPA’s MOBILE6.2 model, corresponding to speed estimates from the transportation models, were multiplied with the VMT estimates to calculate the total emissions. Samples of MOBILE6.2 inputs are included in Exhibit 8. All input files and model output files are available on CD by request.

TASK 5: DETERMINE BUILD EMISSIONS

All the projects which do not fall in the No Build Category, are called Build Projects. The MPOs coded these projects into the Transportation Models, performed model runs and calculated the build emissions. In addition, emissions from the projects that cannot be coded into the models “off-model” projects are added to the model outputs, to calculate the total build emissions. Appendices B, C and D contain the MPO reports describing the methods and results of analysis of the “build projects” using the transportation models.

Totals of build scenario emissions for each analysis year and each non-attainment budget area are enclosed in Exhibit 1.

TASK 6: ADJUSTMENT BETWEEN HIGHWAY PERFORMANCE MONITORING SYSTEM (HPMS) DATA AND TRANSPORTATION MODELS:

At this time, two non-attainment budget areas (Seacoast non-attainment budget area and Southern NH non-attainment budget area) in New Hampshire are covered by the MPO Transportation Models. The Seacoast non-attainment budget area is covered by one single model by the Seacoast MPO and three different MPO models cover the Southern New Hampshire non-attainment budget area. Since HPMS data and the Transportation Model data are two different tools, there will be a difference in the 2002 emissions inventory estimates of mobile sources (based solely on HPMS data) versus the estimates calculated for conformity (based on transportation model data).

In the Seacoast and Southern New Hampshire non-attainment budget areas, an adjustment factor is calculated to compensate for the difference between HPMS and model outputs. 2002 VOC and NOx adjustment factors were calculated as shown below:

VOC adjustment Factor = VOC emissions in kgs/day from 2002 emissions inventory divided by combined total of 2002 VOC emissions in kgs/day from the three different transportation models (in the case of Southern NH) and one transportation model (in the case of Seacoast).

NOx adjustment Factor = NOx emissions in kgs/day from 2002 emissions inventory divided by combined total of 2002 NOx emissions in kgs/day from the three different transportation models (in the case of Southern NH) and one transportation model (in the case of Seacoast).

These calculations can be seen in Exhibit 6.

This adjustment methodology was developed through a consultation process involving the MPO, NHDOT, and NHDES and was later presented to and agreed upon by the EPA, FHWA and FTA.

TASK 7: PERFORM CONFORMITY TESTS

Based on the third set of amendments to the Federal rule, for Ozone non attainment areas with submitted SIPs, the budget test is the only conformity test which need to be met in each non-attainment budget area for each analysis year:

Build Emissions < Emissions Budget
(Applies to both VOC and NOx)

The emissions budgets are established in the applicable SIP.

In areas without approved mobile source emission budgets (non-attainment towns outside of budgeted areas), the following emission reduction test can be used:

Build Emissions < 2002 Emissions <u>and</u> Build Emissions <= No Build Emissions
(Applies to both VOC and NOx)

The towns to which these tests apply are as follows: Auburn, Bedford, Candia, Chester, Epping, Freemont, Goffstown, Hooksett, Manchester, and Raymond.

In the case of Carbon Monoxide non-attainment areas (City of Manchester and City of Nashua), Build emissions should be less than 2010 budgets as established in the Maintenance plans.

Below is a summary of the emission budgets.

Area	Pollutant	Budget (tons/day)	Budget (kg/day)
Southern NH (NH Portion of the Boston-Lawrence-Worchester nonattainment area)	VOC	10.72	9,725
	NOx	21.37	19,386
Seacoast (Portsmouth-Dover-Rochester nonattainment area)	VOC	6.97	6,323
	NOx	13.68	12,410
Manchester	CO	55.83	50,648
Nashua	CO	60.13	54,550

Result of the Conformity Tests:

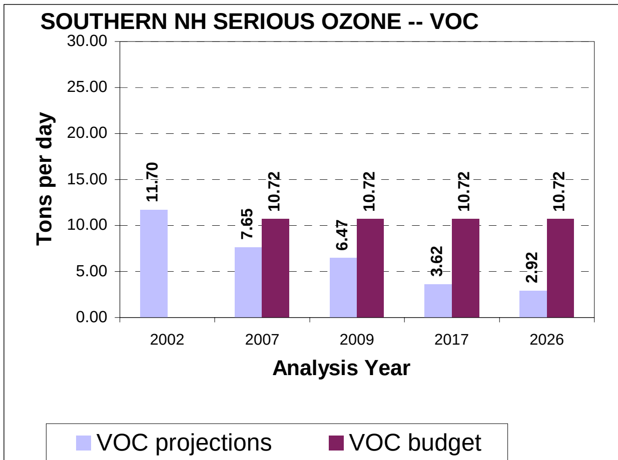
As shown in the charts on the following page and in the tables in Exhibit 1, the applicable conformity test for Ozone was met in each analysis year for the non-attainment budget and non-budgeted areas. In the case of Carbon Monoxide, as shown in the following pages, the applicable conformity test is satisfied.

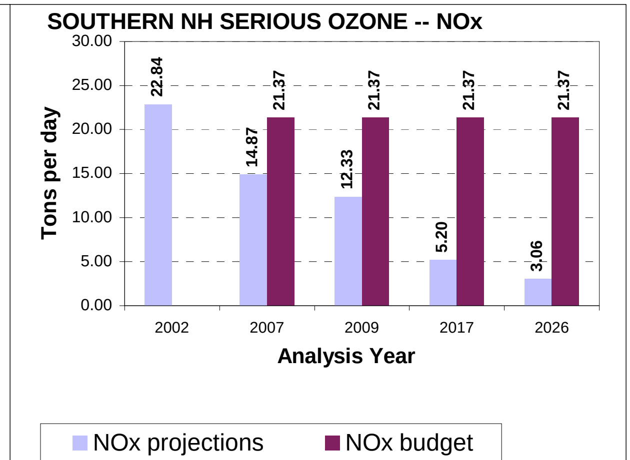
Therefore, positive conformity determinations may be made on the current MPO TIPs and MPO Plans in New Hampshire.

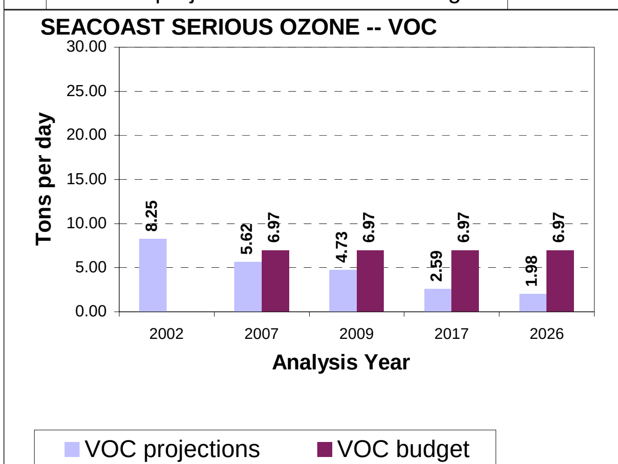
Section 51.418 of the Federal conformity rule requires that MPO Plans, MPO TIPs and projects outside the MPO areas must provide for the timely implementation of any Transportation Control Measures (TCMs) specifically identified in the SIP. At this time, there are no TCMs in New Hampshire's SIP. Therefore, this condition is met.

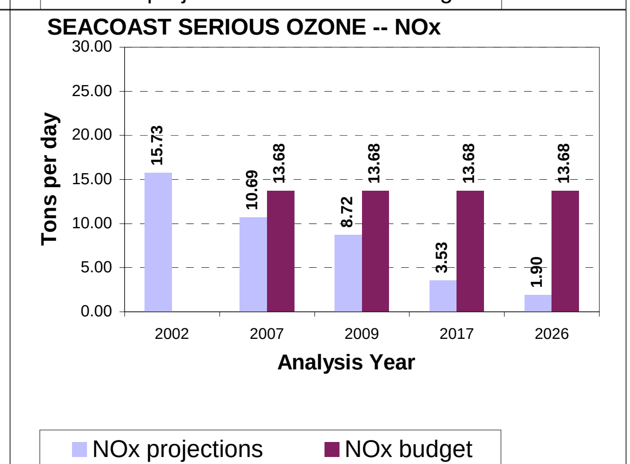
Public Comment Period

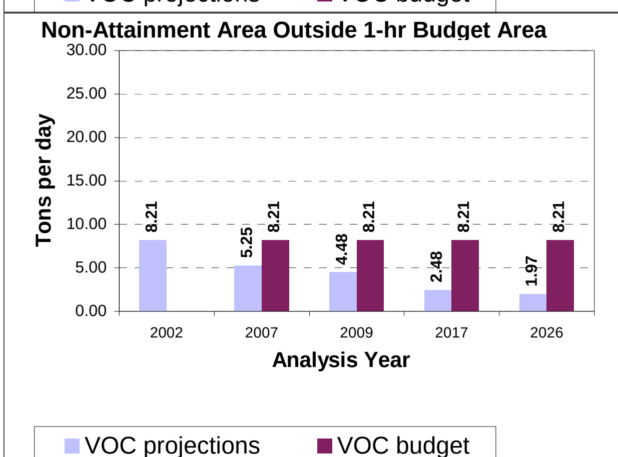
Public comments will be accepted for the draft conformity analysis from October 6, 2006 through December 6, 2006 (4:00 PM) in accordance with New Hampshire Administrative rule, Env-A 1501: Transportation Conformity. Written comments received during this period will be included in this document and all comments will be responded to and corrections made where appropriate. All comments, responses and corrections will be documented.

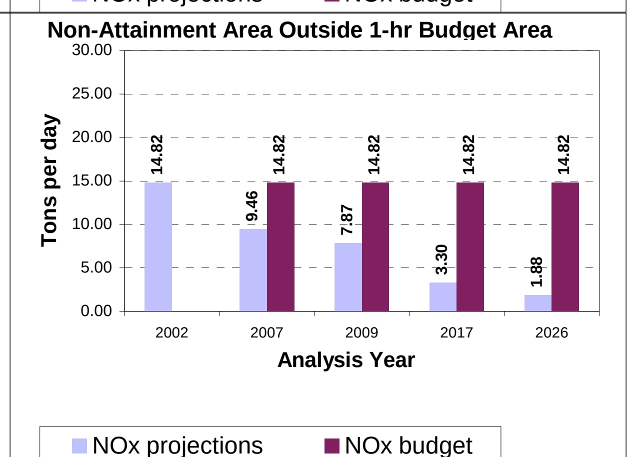

SOUTHERN NH SERIOUS OZONE -- VOC
Tons per day
Analysis Year
2002 2007 2009 2017 2026
11.70
7.65 10.72
6.47 10.72
3.62 10.72
2.92 10.72
VOC projections
VOC budget

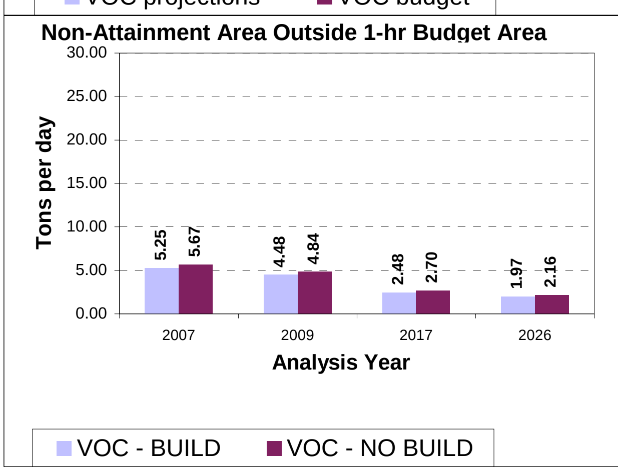

SOUTHERN NH SERIOUS OZONE -- NOx
Tons per day
Analysis Year
2002 2007 2009 2017 2026
22.84
14.87 21.37
12.33 21.37
5.20 21.37
3.06 21.37
NOx projections
NOx budget


SEACOAST SERIOUS OZONE -- VOC
Tons per day
Analysis Year
2002 2007 2009 2017 2026
8.25
5.62 6.97
4.73 6.97
2.59 6.97
1.98 6.97
VOC projections
VOC budget


SEACOAST SERIOUS OZONE -- NOx
Tons per day
Analysis Year
2002 2007 2009 2017 2026
15.73
10.69 13.68
8.72 13.68
3.53 13.68
1.90 13.68
NOx projections
NOx budget


Non-Attainment Area Outside 1-hr Budget Area
Tons per day
Analysis Year
2002 2007 2009 2017 2026
8.21
5.25 8.21
4.48 8.21
2.48 8.21
1.97 8.21
VOC projections
VOC budget


Non-Attainment Area Outside 1-hr Budget Area
Tons per day
Analysis Year
2002 2007 2009 2017 2026
14.82
9.46 14.82
7.87 14.82
3.30 14.82
1.88 14.82
NOx projections
NOx budget


Non-Attainment Area Outside 1-hr Budget Area
Tons per day
Analysis Year
2007 2009 2017 2026
5.25 5.67
4.48 4.84
2.48 2.70
1.97 2.16
VOC - BUILD
VOC - NO BUILD

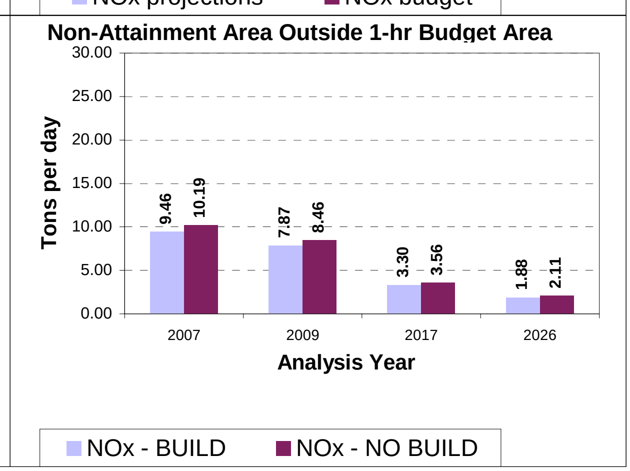

Non-Attainment Area Outside 1-hr Budget Area
Tons per day
Analysis Year
2007 2009 2017 2026
9.46 10.19
7.87 8.46
3.30 3.56
1.88 2.11
NOx - BUILD
NOx - NO BUILD

Exhibit 1.
Total Emissions Tables for each Non-attainment budget area

CARBON MONOXIDE ANALYSIS SUMMARY
CITY OF NASHUA

YEAR	SCENARIO	VMT	CO ton/day (Winter)	CO Budget (ton/day)	YEAR
2010	Build	1,805,196	29.33	60.13	2010
2017	Build	1,956,346	23.40	60.13	2017
2026	Build	2,146,235	23.56	60.13	2026

CO ANALYSIS RESULTS FOR MANCHESTER

	Scenario	Average Daily Values		
		VMT	CO (ton/day)	CO Budget (ton/day)
2010	Build	2,107,311	28.66	55.83
2017	Build	2,294,938	24.66	55.83
2026	Build	2,512,196	24.49	55.83

NONATTAINMENT AREA : SOUTHERN NH SERIOUS OZONE

VOC (HCs) in ton/day

	PORTION NASHUA MPO AREA (1)(2)	PORTION MANCHESTER MPO AREA (1)(2)	PORTION RPC AREA (1)(2)	**TOTAL**	**ADJUSTED TOTAL (1)**	**BUDGET**	**TESTS**		
							INVENTORY=0,012 KGS/DAY		
2002 base year	5.72	2.25	4.81	12.77	11.70		ADJUSTMENT=		0.92
2007 BUILD	3.56	1.43	3.36	8.35	7.65	10.72	BUILD<BUDGET?	True	
2007 BUDGET	*	*	*				Margin of Safety =		3.07
2009 BUILD	3.03	1.22	2.81	7.07	6.47	10.72	BUILD<BUDGET?	True	
2009 BUDGET	*	*	*				Margin of Safety =		4.25
2017 BUILD	1.75	0.69	1.51	3.95	3.62	10.72	BUILD<BUDGET?	True	
2017 BUDGET	*	*	*				Margin of Safety =		7.10
2026 BUILD	1.46	0.56	1.17	3.19	2.92	10.72	BUILD<BUDGET?	True	
2026 BUDGET	*	*	*				Margin of Safety =		7.80

NOx in ton/day

	PORTION NASHUA MPO AREA (1)(2)	PORTION MANCHESTER MPO AREA (1)(2)	PORTION RPC AREA (1)(2)	**TOTAL**	**ADJUSTED TOTAL (1)**	**BUDGET**	**TESTS**		
							INVENTORY=0,023 KGS/DAY		
2002 base year	10.08	4.22	8.95	23.25	22.84		ADJUSTMENT=		0.98
2007 BUILD	6.48	2.70	5.96	15.14	14.87	21.37	BUILD<BUDGET?	True	
2007 BUDGET	*	*	*	*			Margin of Safety =		6.49
2009 BUILD	5.35	2.25	4.95	12.55	12.33	21.37	BUILD<BUDGET?	True	
2009 BUDGET	*	*	*	*			Margin of Safety =		9.04
2017 BUILD	2.31	0.96	2.02	5.29	5.20	21.37	BUILD<BUDGET?	True	
2017 BUDGET	*	*	*	*			Margin of Safety =		16.17
2026 BUILD	1.47	0.55	1.10	3.12	3.06	21.37	BUILD<BUDGET?	True	
2026 BUDGET	*	*	*	*			Margin of Safety =		18.31

* Budgets are not created for each portion of the nonattainment area

(1) Adjusted Total = Total*Adjustment. 2002 base year Adjusted Total emissions are HPMS based and are taken from "2002 HPMS VMT Emissions".
(2) 2002 base year emissions are outputs from MPO Models

NONATTAINMENT AREA : SEACOAST SERIOUS OZONE

VOC (HCs) in ton/day

	SEACOAST MPO AREA	ADJUSTED TOTAL	BUDGET			
				INVENTORY=0,008 KGS/DAY		
2002 base year	9.43	8.25	0.00	ADJUSTMENT=		0.88
2007 BUILD	6.42	5.62	6.97	BUILD<BUDGET?	True	
2007 BUDGET				Margin of Safety =		1.35
2009 BUILD	5.40	4.73	6.97	BUILD<BUDGET?	True	
2009 BUDGET				Margin of Safety =		2.24
2017 BUILD	2.96	2.59	6.97	BUILD<BUDGET?	True	
2017 BUDGET				Margin of Safety =		4.38
2026 BUILD	2.27	1.98	6.97	BUILD<BUDGET?	True	
2026 BUDGET				Margin of Safety =		4.99

NOx in ton/day

	SEACOAST MPO AREA	ADJUSTED TOTAL	BUDGET			
				INVENTORY=0,016 KGS/DAY		
2002 base year	17.82	15.73		ADJUSTMENT=		0.8829
2007 BUILD	12.10	10.69	13.68	BUILD<BUDGET?	True	
2007 BUDGET				Margin of Safety =		2.99
2009 BUILD	9.88	8.72	13.68	BUILD<BUDGET?	True	
2009 BUDGET				Margin of Safety =		4.96
2017 BUILD	4.00	3.53	13.68	BUILD<BUDGET?	True	
2017 BUDGET				Margin of Safety =		10.15
2026 BUILD	2.15	1.90	13.68	BUILD<BUDGET?	True	
2026 BUDGET				Margin of Safety =		11.78

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Non-Attainment Area Outside 1-hr Budget Area, BUILD < BASE YEAR TEST

VOC (HCs) in ton/day

	PORTION MANCHESTER MPO AREA (1)	PORTION RPC AREA (1)	**TOTAL**	**TESTS**		
2002 base year	7.22	0.99	8.21			
2007 BUILD	4.62	0.63	5.25	BUILD<2002?	True	
				Margin of Safety =		2.96
2009 BUILD	3.95	0.53	4.48	BUILD<2002?	True	
				Margin of Safety =		3.73
2017 BUILD	2.18	0.30	2.48	BUILD<2002?	True	
				Margin of Safety =		5.74
2026 BUILD	1.73	0.24	1.97	BUILD<2002?	True	
				Margin of Safety =		6.24

NOx in ton/day

	PORTION MANCHESTER MPO AREA (1)(2)	PORTION RPC AREA (1)	**TOTAL**	**TESTS**		
2002 base year	12.94	1.87	14.82			
2007 BUILD	8.26	1.20	9.46	BUILD<2002?	True	
				Margin of Safety =		5.36
2009 BUILD	6.88	0.99	7.87	BUILD<2002?	True	
				Margin of Safety =		6.95
2017 BUILD	2.89	0.41	3.30	BUILD<2002?	True	
				Margin of Safety =		11.52
2026 BUILD	1.65	0.23	1.88	BUILD<2002?	True	
				Margin of Safety =		12.94

(1) Emissions in Columns 1 and 2 are based on MPO models.
(2) Emissions in Column 1 reflect credits from TMC center (see Exhibit 10).

Non-Attainment Area Outside 1-hr Budget Area, BUILD <= NO BUILD TEST

VOC (HCs) in ton/day

	PORTION MANCHESTER MPO AREA (1)	PORTION RPC AREA (1)	**TOTAL**	**TESTS**		
2007 NO BUILD	5.04	0.63	5.67			
2007 BUILD	4.62	0.63	5.25	BUILD<=NO BUILD?	True	
				Margin of Safety =		0.42
2009 NO BUILD	4.30	0.54	4.84			
2009 BUILD	3.95	0.53	4.48	BUILD<=NO BUILD?	True	
				Margin of Safety =		0.36
2017 NO BUILD	2.41	0.30	2.70			
2017 BUILD	2.18	0.30	2.48	BUILD<=NO BUILD?	True	
				Margin of Safety =		0.23
2026 NO BUILD	1.92	0.24	2.16			
2026 BUILD	1.73	0.24	1.97	BUILD<=NO BUILD?	True	
				Margin of Safety =		0.19

NOx in ton/day

	PORTION MANCHESTER MPO AREA (1)	PORTION RPC AREA (1) (2)	**TOTAL**	**TESTS**		
2007 NO BUILD	8.99	1.20	10.19			
2007 BUILD	8.26	1.20	9.46	BUILD<=NO BUILD?	True	
				Margin of Safety =		0.72
2009 NO BUILD	7.47	0.99	8.46			
2009 BUILD	6.88	0.99	7.87	BUILD<=NO BUILD?	True	
				Margin of Safety =		0.59
2017 NO BUILD	3.15	0.41	3.56			
2017 BUILD	2.89	0.41	3.30	BUILD<=NO BUILD?	True	
				Margin of Safety =		0.27
2026 NO BUILD	1.88	0.23	2.11			
2026 BUILD	1.65	0.23	1.88	BUILD<=NO BUILD?	True	
				Margin of Safety =		0.23

(1) Emissions in Columns 1 and 2 are based on MPO models.
(1) Emissions in Columns 2 are emissions from Freemont and Epping only. As there are no projects in these areas, BUILD = NO BUILD.

Exhibit 2.
Ozone Non-attainment Map

OZONE NONATTAINMENT AREAS EIGHT HOUR STANDARD

New Hampshire DOT
Department of Transportation
Bureau of Transportation Planning

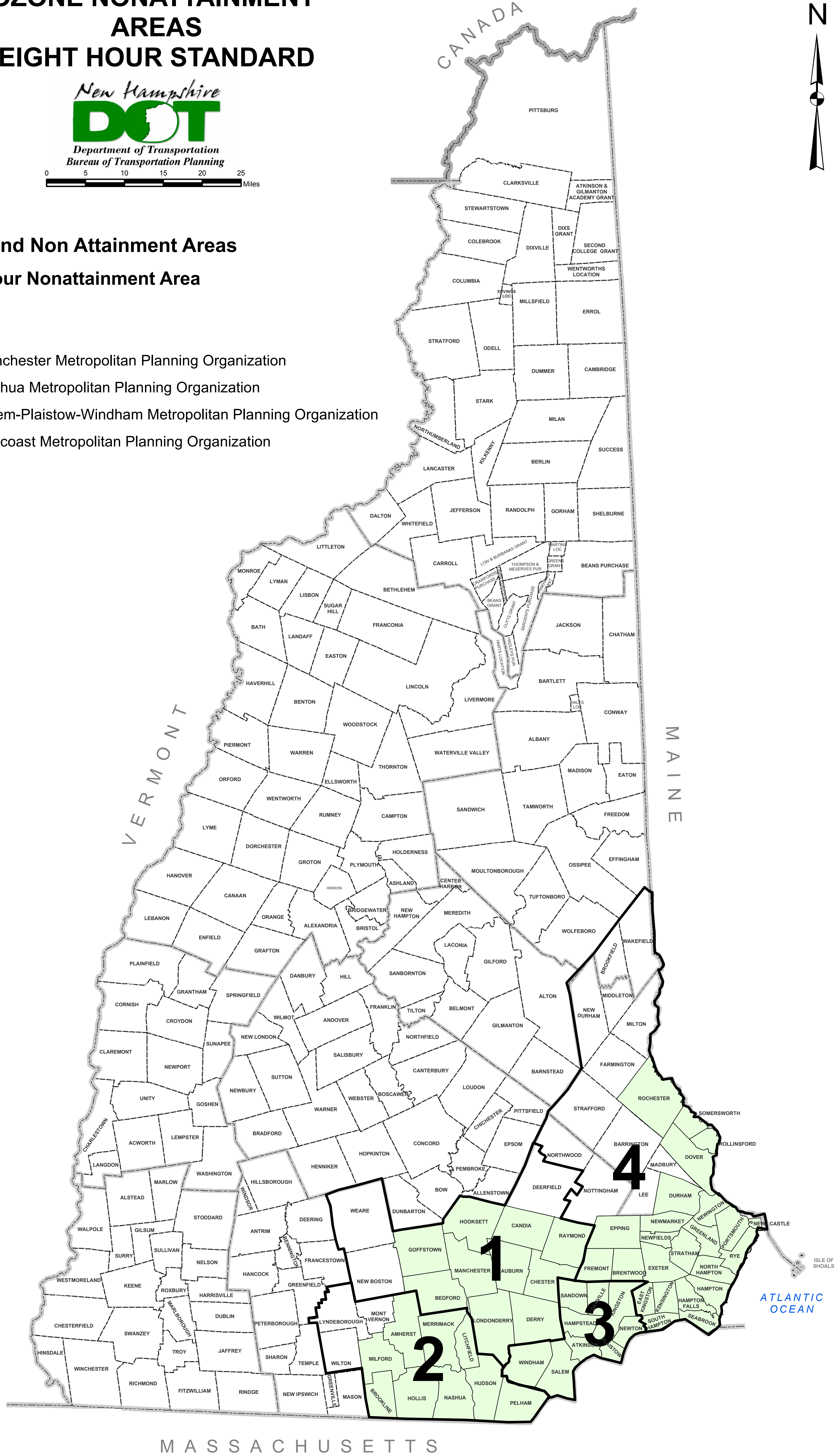
0 5 10 15 20 25 Miles

MPOs and Non Attainment Areas

Eight Hour Nonattainment Area

MPOs

1 Manchester Metropolitan Planning Organization
2 Nashua Metropolitan Planning Organization
3 Salem-Plaistow-Windham Metropolitan Planning Organization
4 Seacoast Metropolitan Planning Organization



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Revised: March 2006

Exhibit 3.
Exempt Code List

PROJECTS EXEMPT FROM CONFORMITY

SAFETY

E-1 Railroad/highway crossing.
E-2 Hazard elimination program.
E-3 Safer non-Federal Aid system roads.
E-4 Shoulder improvements.
E-5 Increasing sight distance.
E-6 Safety improvement program.
E-7 Traffic control devices and operating assistance other than signalization projects.
E-8 Railroad/highway crossing warning devices.
E-9 Guardrails, median barriers, crash cushions.
E-10 Pavement resurfacing and/or rehabilitation.
E-11 Pavement marking demonstration.
E-12 Emergency relief (23 U.S.C. 125).
E-13 Fencing.
E-14 Skid treatments.
E-15 Safety roadside rest areas.
E-16 Adding medians.
E-17 Truck climbing lanes outside the urbanized area.
E-18 Lighting improvements.
E-19 Widening narrow pavements or reconstructing bridges (no additional travel lanes).
E-20 Emergency truck pullovers.

MASS TRANSIT

E-21 Operating assistance to transit agencies.
E-22 Purchase of support vehicles.
E-23 Rehabilitation of transit vehicles.{1}
E-24 Purchase of office, shop, and operating equipment for existing facilities.
E-25 Purchase of operating equipment for vehicles (e.g., radios, fareboxes, lifts, etc.)
E-26 Construction or renovation of power, signal, communications systems.
E-27 Construction of small passenger shelters and information kiosks.
E-28 Construction or renovation of transit buildings and structures (e.g., rail or bus buildings, storage and maintenance facilities, stations, terminals, and ancillary structures).
E-29 Rehabilitation or reconstruction of track structures, track, and track bed in existing rights-of-way.
E-30 Purchase of new buses and rail cars to replace existing vehicles or for minor expansions of the fleet.{1}
E-31 Construction of new bus or rail storage/maintenance facilities categorically excluded in 23 CFR part 771.

AIR QUALITY

E-32 Continuation of ride-sharing and van-pooling promotion activities at current levels.
E-33 Bicycle and pedestrian facilities.

OTHER

Specific activities which do not involve or lead directly to construction, such as:
E-34 Planning and technical studies.
E-35 Grants for training and research programs.
E-36 Planning activities conducted pursuant to titles 23 and 49 U.S.C.
E-37 Federal-aid systems revisions.
E-38 Engineering to assess social, economic, and environmental effects of the proposed action to alternatives to that action.
E-39 Noise attenuation.
E-40 Advance land acquisitions (23 CFR part 712 or 23 CFR part 771).
E-41 Acquisition of scenic easements.
E-42 Plantings, landscaping, etc.
E-43 Sign removal.
E-44 Directional and informational signs.
E-45 Transportation enhancement activities (except rehabilitation and operation of historic transportation buildings, structures or facilities).
E-46 Repair of damage caused by natural disasters, civil unrest, or terrorist acts, exempt projects involving substantial functional, locational or capacity changes.
ATT. Project is located in attainment area and, therefore, not subject to conformity.

PROJECTS EXEMPT FROM REGIONAL EMISSIONS ANALYSES

E-51 Intersection channelization projects.
E-52 Intersection signalization projects at individual intersections.
E-53 Interchange reconfiguration projects.
E-54 Changes in vertical and horizontal alignment.
E-55 Truck size and weight inspection stations.
E-56 Bus terminals and transfer points.

OTHER EXEMPT CODES

N/E Project is not exempt
{1} PM10 nonattainment or maintenance areas, such projects are exempt only if they are in compliance with control measures in the applicable implementation plan.

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Exhibit 4.
Exempt/Not Exempt Project List in the Ten-Year Period (2007-2016)

Exempt / Not Exempt Projects in the 2007-2010 STIP and Not Exempt Projects in the 2007-2016 Ten Year Plan

CAA Code	Proj Id	Town	Project #	FY	Phase	Route/Road	ScopeOfWork
ATT	6149	ALBANY	13632C			NH 112	INSTALL RWIS IN DISTRICT 3
				2007	CON		
ATT	6103	ALSTEAD	14540M			NH 123	NH 123 - FROM LAKE WARREN DAM WEST APPROX 4 MILES TO MURPHY HILL RD; RECONSTRUCT OCTOBER 2005 FLOOD, TO INCLUDE BRIDGES: 060/159, 073/163, 097/142, 107/130, 111/129
				2007	PE		
					ROW		
				2008	CON		
ATT	6215	ALSTEAD	14541I			NH 123	RECONST ON NEW ALIGNMENT BEGINNING APPROX 1500' WEST OF COBB HILL ROAD & GO APPROX 2500', RECONST COBB HILL RD & NH 123 BR #097/142, BEGIN APPROX 1500' (Funding is FHWA-ER) [Oct 2005 Floods]
				2007	CON		
ATT	6216	ALSTEAD	14541J			NH 123	RECONSTRUCT NH123 AND APPROACHES TO NH12A & GRIFFIN HILL ROAD BEGINNING APPROX 1000' EAST OF NH 123A, GO EAST 3500' TO BR #087/155 OVER WARREN BROOK, (Funding is FHWA-ER) [Oct 2005 Floods]
				2007	CON		
ATT	6274	ALSTEAD	14541K			NH 12A & NH 123	REPAIR BRIDGE OVER COLD RIVER - 060/159 [October 2005 Flood]
				2007	CON		
ATT	3656	ALTON	13802			NH 28	REPLACE BRIDGE & APPROACH WORK OVER MERRYMEETING RIVER - 186/155
				2007	PE		
					ROW		
					CON		
ATT	106	ALTON - GILFORD	10606			NH 11	RECONSTRUCTION NEAR ELLOCOYA STATE PARK SOUTHEAST 4.75 MILES TO MINGE BROOK
				2008	PE		
				2009	PE		
				2010	PE		
					ROW		
E-45	6230	AMHERST	06-01TE				TOWN HALL BEAUTIFICATION AND SAFETY: ADD GREEN SPACE IMMEDIATELY IN FRONT OF THE TOWN HALL AND IN FRONT OF THE ADJOINING OLD BURIAL GROUNDS. IMPROVE PEDESTRIAN SAFETY AND TO REDUCE PAVED SURFACES WHICH WILL REDUCE STORM WATER RUNOFF. [06-01TE]
				2008	PE		
				2009	ROW		
				2010	CON		
ATT	2754	ANDOVER				US 4	RECONSTRUCT APPROXIMATELY 2.0 MILES FROM SALISBURY T/L WESTERLY
				2008	PE		
				2009	PE		
ATT	3260	ANDOVER	14169			NH 11 & 4A	BRIDGE OVER US 4 & NHRR (ABD) - 058/103, REHABILITATION OR REMOVAL
				2007	PE		
					ROW		
				2008	CON		

CAA Code	Proj Id	Town	Project #	FY	Phase	Route/Road	ScopeOfWork
ATT	3522	ANDOVER	14172			NH 11	RECONSTRUCT FROM CHANNELL ROAD TO HOYT ROAD - APPROX. 1.5 MILES
				2007	PE		
					ROW		
				2008	PE		
				2010	ROW		
ATT	6231	ANDOVER - WILMOT - DANBURY	06-02TE				NORTHERN RAIL TRAIL: IMPROVEMENTS: CONSTRUCT LEDGE PACK SURFACE ON NORTHERN RAIL CORRIDOR FROM DANBURY THROUGH WILMOT AND ENDING IN ANDOVER. APPROXIMATELY 8.3 MILES IN LENGTH. [06-02TE]
				2008	PE		
					ROW		
				2010	CON		
ATT	6232	ANTRIM	06-03TE			US 202 / NH 31 MAIN STREET	REHABILITATION PHASE 2: CONTINUE EXISTING PROJECT TO RECONSTRUCT SIDEWALKS, SHOULDERS AND DRAINAGE TO IMPROVE THE DOWNTOWN PEDESTRIAN FACILITIES AND COMPLETE TRAFFIC CALMING AND PEDESTRIAN FLOW IMPROVEMENTS. [06-03TE]
				2007	PE		
				2008	PE		
				2009	ROW		
ATT	3163	ASHLAND - BRIDGEWATER	14272			US 3	BRIDGE PAINTING OVER PEMIGEWASSET RIVER - 076/080
				2007	ROW		
				2010	CON		
E-10	3283	ATKINSON - HAMPSTEAD				NH 111	RECONSTRUCT FROM CENTRAL STREET IN HAMPSTEAD TO THE SOUTHERN MOST ATKINSON / HAMPSTEAD TOWN LINE (3.2 MILES)
				2008	PE		
				2009	PE		
					ROW		
ATT	2738	BARNSTEAD - ALTON	14121			NH 28	RECONSTRUCTION FROM THE ALTON CIRCLE SOUTH APPROXIMATELY 7.0 MILES TO THE IMPROVED SECTION IN BARNSTEAD [Section 1702 - Designated Project; Demo Id NH040] [Sister Demo Id NH056 & NH069]
				2008	PE		
					ROW		
				2009	PE		
					ROW		
					CON		
				2010	PE		
					ROW		
ATT	557	BARTLETT	13043			US 302	REPLACE BRIDGE OVER NHRR - 188/123 & OVER SACO RIVER - 189/129 TO INCLUDE APPROACHES
				2007	CON		
ATT	90	BATH - LISBON	10425			US 302 / NH 10	ROADWAY & BRIDGE RECONSTRUCTION & RELOCATION OF APPROXIMATELY 8.9 km (5.5 mi) ALONG US 302 & NH 10 AND LOCAL ROADS (Pe & Row)
				2007	PE		
				2008	PE		
					ROW		
				2009	ROW		
				2010	PE		
E-19	3036	BEDFORD	13527			US 3	REPLACE BRIDGE OVER F.E.E.T. - 189/121 & ASSOCIATED APPROACH WORK
				2007	PE		
				2010	CON		

CAA Code	Proj Id	Town	Project #	FY	Phase	Route/Road	ScopeOfWork
E-6	5717	BEDFORD	13692A			NH 101	INTERSECTION IMPROVEMENT AT HARDY/JENKINS [Section 115 - Designated Project NH023]
				2007	PE		
					ROW		
				2008	PE		
					CON		
N/E	1818	BEDFORD	13953			NH 101	WIDEN TO 5 LANES FOR APPROXIMATELY 2 MILES, FROM NH 114 TO WALLACE ROAD
				2007	PE		
				2008	PE		
				2009	PE		
				2010	PE		
				2012	ROW		
				2014	CON		
N/E	2844	BEDFORD - MANCHESTER - LONDONDERRY	11512A			AIRPORT ACCESS ROAD	CONSTRUCT BRIDGE OVER MERRIMACK RIVER, NH 3A, AND BRIDGE BOX CULVERT UNDER NH 3A FOR WILDLIFE CROSSING
				2007	CON		
N/E	5669	BEDFORD - MANCHESTER - LONDONDERRY	11512C			AIRPORT ACCESS ROAD	CONSTRUCT FE EVERETT TPK BRIDGE OVER MANCHESTER AIPORT ACCESS ROAD (MAAR) AND RAMP A & C BRIDGES
				2007	CON		
N/E	3794	BEDFORD - MANCHESTER - LONDONDERRY - MERRIMACK	11512F			AIRPORT ACCESS ROAD	CONSTRUCT US 3, RAMPS H AND J, AND AIRPORT ACCESS ROAD BRIDGE OVER US 3
				2009	CON		
N/E	5670	BEDFORD - MANCHESTER - LONDONDERRY - MERRIMACK	11512H			AIRPORT ACCESS ROAD	CONSTRUCT NORTH OF LITTLE COHAS BRIDGE AND FINAL PAVING TO NH 3A
				2009	CON		
				2010	CON		
N/E	5671	BEDFORD - MANCHESTER - LONDONDERRY - MERRIMACK	11512I			AIRPORT ACCESS ROAD	WIDEN FE EVERETT TURNPIKE
				2009	CON		
				2010	CON		
DNA	5951	BEDFORD - MANCHESTER - LONDONDERRY - MERRIMACK	11512J			AIRPORT ACCESS ROAD	EARTHWORK CONTRACT WEST OF THE MERRIMACK RIVER
				2009	CON		
N/E	3150	BEDFORD - MANCHESTER - LONDONDERRY- MERRIMACK	11512D			AIRPORT ACCESS ROAD	CONSTRUCT ACCESS ROAD OVER LITTLE COHAS RIVER AND ACCESS ROAD TO THE MERRIMACK RIVER BRIDGE
				2008	CON		
N/E	194	BEDFORD-MANCHESTER-LONDONDERRY-MERRIMACK	11512			AIRPORT ACCESS ROAD	IMPROVE ACCESS FROM F.E.E.T. TO MANCHESTER AIRPORT AND SURROUNDING AREA, PRELIMINARY DESIGN PREPARATION EIS FINAL DESIGN [PE & ROW]
				2007	PE		
					ROW		
				2008	PE		
					ROW		
				2009	PE		
					ROW		
				2010	PE		
					ROW		

CAA Code	Proj Id	Town	Project #	FY	Phase	Route/Road	ScopeOfWork
ATT	709	BELMONT	12792			NH 140	UPGRADE FROM NORTHFIELD T/L THROUGH TO NH 106
				2008	PE		
				2009	PE		
					ROW		
				2010	PE		
					ROW		
ATT	5637	BELMONT	14400			LAKE WINNISQUAM SCENIC TRAIL	CONSTRUCT A MULTI-USE TRAIL (Segments 9 & 10 - Approx 1.7 Miles) FROM US 3 TO THE TOWN BEACH ("Winnisquam Lake Trail" - 5.2 Miles)[04-03TE]
				2007	PE		
					CON		
ATT	6233	BELMONT	14829				PHASE 2, LAKE WINNISQUAM SCENIC TRAIL: CONSTRUCT HARD PACK GRAVEL SURFACE, 8' WIDE FROM US 3 IN BELMONT TO JEFFERSON ROAD IN BELMONT [06-06TE]
				2007	PE		
				2008	PE		
				2009	ROW		
ATT	2787	BELMONT - LACONIA				NH 106	RECONSTRUCT FROM 0.4 MILES NORTH OF US 3 / NH 11 BYPASS SOUTHERLY INTO BELMONT SOUTH OF OPECHEE PLAZA
				2008	PE		
				2009	PE		
					ROW		
ATT	5638	BENNINGTON	14401			VARIOUS	VILLAGE PEDESTRIAN IMPROVEMENTS: RECONSTRUCT APPROX. 2,800' OF ROADSIDE IN THE VILLAGE TO RESTORE DEFINITION OF PEDESTRIAN ACCESS BY WAY OF SIDEWALKS AND CROSSWALKS. RECONSTRUCT SIDEWALKS, DELINEATION OF ROADWAY AND PARKING WITH GRANITE CURBING. IMPROV
				2007	ROW		
					CON		
ATT	3763	BERLIN	12958B			NH 110	PHASE 2 RECONSTRUCTION FROM FIRST AVENUE TO WIGHT STREET (APPROX.0.7 MILES) [Section 1702 - Designated Project; Demo Id NH043] [Sister Demo Id NH062]
				2007	PE		
					ROW		
				2008	ROW		
				2009	ROW		
					CON		
ATT	2331	BETHLEHEM	13087			US 302	CORRECTION OF TRAFFIC & PEDESTRIAN SAFETY DEFICIENCIES; INCLUDING SIDEWALKS, CURBING, CROSSWALKS, SIGNING, & LIGHTING IN THE CENTER OF TOWN [98-77TE]
				2007	CON		
ATT	1881	BOSCAWEN	13957			US 4	RECONSTRUCT INTERSECTION @ GOODHUE ROAD AND RAYMOND ROAD
				2007	ROW		
				2010	CON		
ATT	5639	BOSCAWEN	14402			NORTH MAIN ST	KING ST SIDEWALK CONNECTOR: CONSTRUCT SIDEWALKS ALONG NORTH MAIN ST FROM EXISTING SIDEWALK TO INTERSECTION OF US 3/4 & FROM US 3/4 INTERSECTION TO RIVER RD CONNECTING WITH EXISTING SIDEWALK ON KING ST. PROVIDE PED WALK SIGNAL AND CROSS WALKS AT US 3/4
				2007	PE		
				2008	CON		
ATT	2075	BOW - CONCORD	13742			I-93	WIDEN FROM I-89 TO BETWEEN EXITS 15 AND 16 TO MATCH INTO EXISTING CONCORD PROJECT 11449 @ EXIT 16; 163/106, 136/160, 135/160, 203/087, 142/116
				2007	PE		
				2008	PE		
				2009	PE		
					ROW		
				2010	PE		
					ROW		

CAA Code	Proj Id	Town	Project #	FY	Phase	Route/Road	ScopeOfWork
ATT	2747	CHESTERFIELD	13597			NH 63	RECONSTRUCTION ON NEW LOCATION IN AREA OF SPOFFORD LAKE
				2007	PE		
					ROW		
				2008	PE		
					ROW		
				2009	PE		
					ROW		
				2010	PE		
ATT	739	CLAREMONT	13248			NH 12	NORTH STREET INTERSECTION RELOCATION [Section 1702 - Designated Project; Demo Id NH039] [Sister Demo Id NH059]
				2007	PE		
					ROW		
				2008	PE		
					ROW		
				2009	PE		
ATT	4230	CLAREMONT	14494			NH 11/ NH 12	RECONSTRUCTION AND UPGRADE OF THE INTERSECTIONS OF MAPLE AVENUE, PLEASANT STREET (DRAPER'S CORNER), AND CHARLESTOWN RD [Section 117 - Designated Project; Demo Id NH030] [Sister Demo Id NH047 & 065]
				2007	PE		
				2008	PE		
					ROW		
				2009	PE		
					ROW		
				2010	ROW		
					CON		
E-24	3067	COAST				COAST	MISC. SUPPORT EQUIPMENT
				2007	UNK		
				2008	UNK		
				2009	UNK		
				2010	UNK		
E-28	3068	COAST				COAST	MISC. BUS STATION EQUIPMENT
				2007	UNK		
				2008	UNK		
				2009	UNK		
				2010	UNK		
E-36	3069	COAST				COAST	GENERAL & COMPREHENSIVE PLANNING
				2007	UNK		
				2008	UNK		
				2009	UNK		
				2010	UNK		
ATT	571	COLEBROOK	13476			NH 26	BRIDGE REHABILITATION OVER MOHAWK RIVER - 147/068
				2008	PE		
				2010	PE		
					ROW		
ATT	6150	COLEBROOK	P2493E			US 3	INSTALL RWIS IN VICINITY OF COLEBROOK WELCOME CENTER
				2007	CON		

CAA Code	Proj Id	Town	Project #	FY	Phase	Route/Road	ScopeOfWork
ATT	3638	CONCORD				I-393	FEASIBILITY STUDY OF INTERCHANGE (EXIT 2 1/2) TO CONNECT I-393 TO STEEPLEGATE MALL
				2007	PE		
				2008	PE		
ATT	6220	CONCORD	06-02CM			STORRS STREET	PARK AND RIDE
				2009	PE		
				2010	ROW		
ATT	293	CONCORD	12004			SEWALLS FALLS ROAD	REPLACE BRIDGE OVER MERRIMACK RIVER - 070/117 [Section 1702 - Designated Project; Demo Id NH045]
				2007	PE		
					ROW		
				2008	PE		
					ROW		
				2009	PE		
					ROW		
				2010	CON		
ATT	6205	CONCORD	13184C			I-393	CONSTRUCT DRAINAGE AND OVERLAY PAVEMENT FROM NORTH MAIN STREET EAST TO HORSE SHOE POND INTERSECTION
				2007	ROW		
					CON		
ATT	3701	CONCORD	13860			LOUDON RD / PEMBROKE RD / OLD TPK RD	CONSTRUCT COMBINATION OF SIDEWALKS & BIKE PATHS ALONG WITH CURBING, DRAINAGE [02-03CM]
				2007	CON		
ATT	3700	CONCORD	13865			US 3	CONSTRUCT SIDEWALKS TO AASHTO STANDARDS TO FILL IN EXISTING SIDEWALK GAPS REDUCE MOTOR VEHICLE TRAFFIC [02-05CM]
				2007	CON		
ATT	3726	CONCORD	13889				NORTH MAIN STREET;CAT BUS SHELTERS - EAGLE SQUARE & NH STATE HOUSE: DESIGN AND CONSTRUCT 2 BUS SHELTERS ON NORTH MAIN STREET, ONE IN FRONT OF NH STATE HOUSE AND A SECOND ONE ACROSS THE STREET IN FRONT OF THE HISTORIC EAGLE SQUARE HOTEL [02-14TE]
				2007	CON		
ATT	5615	CONCORD	14426			CENTRE, LIBERTY, & AUBURN ST	CONSTRUCT ROUNDABOUT AT INTERSECTION OF CENTRE, LIBERTY, & AUBURN ST. [04-10CM]
				2007	PE		
					ROW		
					CON		
ATT	144	CONCORD - LACONIA	10672			NH 106	ROADWAY RECONSTRUCTION & IMPROVEMENTS FROM I-393 INTERCHANGE TO THE LACONIA BYPASS (Pe & Row)
				2007	ROW		
				2008	ROW		
ATT	5552	CONWAY				NH 16	BRIDGE REHABILITATION OVER SACO RIVER - 170/071
				2007	PE		
				2008	ROW		
ATT	6234	CONWAY	06-11TE			NH 16	VILLAGE STREETSCAPE PROJECT: REDESIGN WORK INCLUDES SIDEWALK UPGRADES, CROSS WALKS, UTILITY RELOCATION, LANDSCAPING, LIGHTING, AND GATEWAY MARKERS [06-11TE]
				2007	PE		
				2008	PE		
				2009	CON		

CAA Code	Proj Id	Town	Project #	FY	Phase	Route/Road	ScopeOfWork
ATT	176	CONWAY	11339B			US 302 / NH 16	DESIGN & ROW ACQUISITIONS OF THE US 302 / NH 16 CONWAY BYPASS PHASES TO PROVIDE CONGESTION RELIEF [PE & ROW Only; CONSTRUCTION BROKEN INTO OTHER 11339 PROJECTS] [Section 1602 - Designated Project; Demo Id NH004]
				2007	PE		
					ROW		
				2008	PE		
					ROW		
				2009	PE		
					ROW		
				2010	PE		
					ROW		
ATT	6363	CONWAY	14455A			NH 16 / 252 THOMPSON RD / 173 TASKER HILL RD	PARCEL 228, 67, 351 BUILDING DEMOLITIONS
				2007	ROW		
ATT	3268	DANBURY				US 4 & NH 104	INTERSECTION IMPROVEMENTS TO IMPROVE SIGHT DISTANCE, SAFETY AND TRAFFIC FLOW, AND PROVIDE PEDESTRIAN ACCESS AS NEEDED
				2008	PE		
				2009	PE		
					ROW		
				2010	PE		
E-52	3274	DERRY				NH 28	INTERSECTION IMPROVEMENTS AT KILREA ROAD & WINDHAM DEPOT ROAD
				2008	PE		
				2009	PE		
					ROW		
E-51	996	DERRY	13249			NH 28	INTERSECTION IMPROVEMENT @ NH 102
				2007	PE		
					ROW		
				2008	PE		
					ROW		
					CON		
N/E	1816	DERRY / LONDONDERRY	13065			I-93	CONSTRUCTION OF EXIT 4A - NEW INTERCHANGE BETWEEN EXISTING EXIT 4 AND EXIT 5 TO: (1) RELIEVE TRAFFIC; (2) ALLOW ACCESS TO POTENTIAL DEVELOPMENT OF INDUSTRIAL LAND
				2011	CON		
E-33	1127	DOVER	12644			NH 108	CONSTRUCT 2600' SIDEWALK FROM WEEKS CROSSING TO SOUTHERN LIMIT OF THE DOVER - SOMERSWORTH #12608 PROJECT [96-28TE]
				2007	CON		
E-19	2406	DOVER	13042			NH 9	REPLACE BRIDGE OVER B&M RAILROAD - 109/106
				2007	PE		
				2009	CON		
E-33	3004	DOVER	13482			NH 108	CONSTRUCT BIKE PATH ALONG RAIL LINE FROM RAIL STATION TO NH 108 / BELLAMY PARK [00-20TE]
				2007	CON		
E-19	695	DOVER	13796			WASHINGTON STREET	BRIDGE REHABILITATION OVER B&M RAILROAD - 120/118
				2007	PE		
				2008	CON		
E-19	3845	DOVER	13945			WASHINGTON STREET	BRIDGE REPLACEMENT OVER COCHECO RIVER - 136/123 (FUTURE)
				2007	PE		
					ROW		
				2008	CON		

CAA Code	Proj Id	Town	Project #	FY	Phase	Route/Road	ScopeOfWork
N/E	5622	DOVER	14287			INDIAN BROOK DRIVE	CONSTRUCT PARK'N' RIDE FACILITY (Approx 416 spaces) INCLUDING A TERMINAL BUILDING IN THE VICINITY OF EXIT 9 OF THE SPAULDING TURNPIKE [04-32CM]
				2007	CON		
E-32	6182	DOVER - DURHAM - EXETER, NH - BOSTON, MA	14593			VARIOUS	SUPPLEMENT INTER-CITY PASSENGER RAIL SERVICE BETWEEN DOVER, DURHAM, EXETER TO AND FROM BOSTON NORTH STATION WITH THE COMMUTER BUS SERVICE [06-04CM]
				2007	CON		
N/E	6221	DOVER - PORTSMOUTH - BOSTON	06-05CM				INCREASED TRANSIT SERVICE AND INTERCITY BUS MARKETING CAMPAIGN FOR NH 16 / I-95 CORRIDORS [06-05CM & 06-23CM]
				2007	PE		
					CON		
N/E	3288	DOVER - ROCHESTER - SOMERSWORTH				NH 108	WIDENING AND RECONST. FROM THE WEEKS CORNER INT. NORTH 4.8 MILES TO THE NH 108 INT. WITH GRANITE PARKWAY IN ROCHESTER AND WIDENING OF SIXTH ST. CONNECTOR BRIDGE OVER THE SPAULDING TPK AT EXIT 9 WITH NB OFF-RAMP RECONST.
				2011	PE		
				2013	ROW		
				2016	CON		
N/E	187	DOVER - ROCHESTER - SOMERSWORTH	11429			SPAULDING TURNPIKE	CONSTRUCTION OF EXIT 10 & EASTERLY CONNECTION (PE & ROW ACQUISITIONS)
				2007	PE		
					ROW		
				2008	PE		
					ROW		
				2009	PE		
					ROW		
				2010	PE		
					ROW		
N/E	2083	DOVER - ROCHESTER - SOMERSWORTH	11429B			SPAULDING TPK	CONSTRUCTION OF EXIT 10 AND EASTERLY CONNECTION - Phase 1
				2014	CON		
N/E	3555	DOVER - ROCHESTER - SOMERSWORTH	11429C			SPAULDING TURNPIKE	CONSTRUCTION OF EXIT 10 AND EASTERLY CONNECTION - Phase 2
				2015	CON		
N/E	188	DOVER - ROCHESTER - SOMERSWORTH	11429D			SPAULDING TPK	CONSTRUCTION OF EXIT 10 AND EASTERLY CONNECTION - Phase 3
				2016	CON		
N/E	6136	DOVER - ROCHESTER - SOMERSWORTH	11429E			SPAULDING TURNPIKE	FINAL DESIGN OF EXIT 10 FOR ELIGIBLE FEDERALLY FUNDED AREAS (PE & ROW). STATE MATCHING FUNDS PROGRAMMED UNDER 11429F USING TURNPIKE FUNDS
				2008	PE		
					ROW		
				2009	PE		
					ROW		
N/E	6137	DOVER - ROCHESTER - SOMERSWORTH	11429F			SPAULDING TURNPIKE	FINAL DESIGN OF EXIT 10 (ADMINISTRATIVE PROJECT SLIP FOR FEDERAL MATCH FOR 11429E)
				2008	PE		
					ROW		
				2009	PE		
					ROW		
E-51	582	DOVER - SOMERSWORTH	12608			NH 108	ADD LEFT TURN LANE AT LONG HILL ROAD
				2007	CON		

CAA Code	Proj Id	Town	Project #	FY	Phase	Route/Road	ScopeOfWork
ATT	5720	DUBLIN	14318			NH 101	IMPROVEMENTS WITHIN THE VILLAGE AREA TO ENHANCE PEDESTRIAN SAFETY THROUGH TRAFFIC CALMING [Section 115 - Designated Project NH027]
				2007	CON		
ATT	5640	DUBLIN	14319			NH 101 / MAIN ST	PHASE 1: NH 101 PEDESTRIAN IMPROVEMENTS - CONSTRUCT 6,000' SIDEWALK ADJACENT TO MAIN ST. PHASE 1: PEDESTRIAN IMPROVEMENTS [04-11TE]
				2007	CON		
ATT	2766	DUMMER - CAMBRIDGE - ERROL				NH 16	WIDEN & REHABILITATE FROM ERROL SOUTHERLY 10 MILES
				2008	PE		
				2009	PE		
					ROW		
ATT	5641	DUNBARTON	14403			NH 13 / SCHOOL ST / ROGERS RD	TOWN GREEN SAFETY IMPROVEMENT PLAN - REALIGN & CONSTRUCT SIDEWALKS ON ROBERTS ROGERS ROAD TO A "T" INTERSECTION WITH NH 13. CONSTRUCT SIDEWALKS ON ROGERS ROAD FROM ELEMENTARY SCHOOL TO TOWN HALL, COMMON AND LIBRARY AREAS. AND ON NH 13 & SCHOOL ST IN TO
				2008	PE		
				2009	CON		
E-6	3712	DURHAM	13867			MAIN STREET	RECONSTRUCT MAIN ST TO PERMIT BI-DIRECTION TRANSIT SHUTTLE SERVICE / PROJECT INCLUDES BIKE/PED SAFETY IMPROVEMENTS FROM WESTERN EDGE OF CAMPUS TO DOWNTOWN @ PETTEE BROOK LANE [02-07CM] & LIGHTING [06-29CM]
				2007	CON		
N/E	3710	DURHAM	13868				EXPAND OR REPLACE ACCESSIBLE RAIL PLATFORM, STATION RENOVATION TO INCLUDE DEDICATED INDOOR TRAVELER WAITING SPACE AND CONSTRUCTION TO PROVIDE INTERMODAL BUS ACCESS TO PLATFORM AREA [02-08CM]
				2007	ROW		
					CON		
N/E	3711	DURHAM	13869				PURCHASE THREE 14 PASSENGER TRANSIT VEHICLE FOR EXPANSION OF UNH WILDCAT SHUTTLE SYSTEM BEYOND CORE CAMPUS AREAS [02-09CM]
				2007	PE		
					CON		
E-28	5643	DURHAM	14404			UNH RAIL STATION	UNH RAIL STATION RENOVATION - RENOVATE THE HISTORIC ELEMENTS OF THE DURHAM RAIL STATION AND RELATED ELEMENTS. RESTORE THE SIGNAL SEMAPHORE LOCATED ATOP THE STATION [04-15TE]
				2007	CON		
E-33	5642	DURHAM	14405			NH155 A / MAIN ST	NH 155A MAIN STREET IMPROVEMENTS - CONSTRUCT SIDEWALKS, MULTI-USE PATHS & BICYCLE SHOULDERS ALONG NH 155A FOR APPROXIMATELY 1.1 MILES APPROACHING THE UNH CAMPUS AND DOWNTOWN DURHAM [04-13TE]
				2008	PE		
					ROW		
				2009	CON		
N/E	5616	DURHAM	14427			WILDCAT TRANSIT	FLEET REPLACEMENT - PHASE III; PURCHASE CNG OR LOW EMISSION DIESEL (OR EITHER FUEL SOURCE COMBINED WITH HYBRID ELECTRIC SYSTEMS) TRANSIT VEHICLES FOR REPLACEMENT OF EXISTING WILDCAT GAS/DIESEL TRANSIT VEHICLES AND EXPANSION OF TRANSIT FLEET. FUNDS FOR 3-
				2008	PE		
E-33	2296	DURHAM - NEWMARKET	13080			NH 108	CONSTRUCT 4' BIKE SHOULDERS FROM OYSTER RIVER BRIDGE TO DAME ROAD AND SANBORN AVE IN NEWMARKET (3.4MI) [98-17TE]
				2007	PE		
					ROW		
				2008	ROW		

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ATT	585	ENFIELD	12967			MAIN STREET & NH 4A	BRIDGE REPLACEMENT ON MAIN STREET OVER MASCOMA LAKE - 077/139; NH 4A, REHAB. PAVEMENT, ADD SHOULDERS, IMPROVE DRAINAGE
				2007	PE		
				2008	PE		
					ROW		
				2009	PE		
					ROW		
ATT	2933	ENFIELD	13185D			NH 4A	REHABILITATE PAVEMENT, ADD SHOULDERS, AND IMPROVE DRAINAGE & SIGHT DISTANCE, BEGINNING 3.0 MILES SOUTHEAST OF US 4, SOUTHEAST 1.2 MILES
				2007	CON		
ATT	5644	ENFIELD	14406			MAPLE ST	CONSTRUCT A SIDEWALK ALONG MAPLE STREET FROM US 4 TO THE INTERSECTION OF LARAMIE FARMS ACCESS ROAD PROVIDING CONNECTIVITY FROM THE NEIGHBORHOOD TO THE ENFIELD VILLAGE [04-16TE]
				2007	PE		
					ROW		
				2008	ROW		
					CON		
ATT	2761	ENFIELD - LEBANON	13962			I-89	REHAB FROM EXIT 15 TO EXIT 17 (4.0 MILES) [4R]
				2007	PE		
					ROW		
				2008	PE		
					ROW		
				2009	CON		
E-6	1894	EPPING	13712			NH 125	RECONSTRUCTION FROM NH 27 NORTH TO NH 87
				2007	PE		
				2008	PE		
					ROW		
E-6	3287	EXETER				EPPING ROAD	IMPLEMENTATION OF ACCESS MANAGEMENT PLAN DEVELOPED BY EXETER TO LIKELY INCLUDE ROW ACQUISITIONS AND DRIVEWAY CONSOLIDATION
				2007	PE		
				2009	PE		
N/E	3713	EXETER	13871			LINCOLN STREET	EXPAND EXISTING PASSENGER RAILROAD STATION PARKING AREA (PROJECT #10025A) FROM 78 TO 140 PARKING SPACES [02-13CM]
				2007	ROW		
					CON		
E-19	5580	EXETER	14090A			PARK STREET	BRIDGE REPLACEMENT OVER B&M RAILROAD - 088/076
				2008	PE		
					ROW		
				2009	PE		
				2010	PE		
					ROW		
ATT	1880	FITZWILLIAM	13919			NH 12	RECONSTRUCT INTERSECTION @ NH 119 FOR SAFETY IMPROVEMENT
				2009	PE		
				2010	PE		
ATT	6047	FRANKLIN	13928A			US 3	UPGRADE AT INTERSECTION OF INDUSTRIAL PARK DRIVE IN FRANKLIN [Section 1702 - Designated Project; Demo Id NH037] [Sister Demo Id NH057]
				2008	PE		
				2009	PE		
					ROW		

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ATT	3728	FRANKLIN - NORTHFIELD - TILTON	13890				WINNIPESAUKEE RIVER TRAIL PHASE 2: CONSTRUCT TRAIL FROM PARK STREET IN NORTHFIELD THROUGH TILTON AND CROSS OVER OF NH 140 IN TILTON AND THROUGH THE CORRIDOR TO THE BELMONT T/L [02-22TE]
				2007	CON		
ATT	1813	FRANKLIN TO NORTHFIELD					NEW CONNECTOR ROAD FROM NH 3A IN FRANKLIN TO EXIT 19 IN NORTHFIELD (Feasibility Study)
				2007	PE		
				2008	PE		
				2009	PE		
				2010	PE		
ATT	6235	GILFORD	06-16TE			ALVAH WILSON ROAD	VILLAGE SIDEWALK PHASE 4: CONSTRUCT SIDEWALK. THIS SIDEWALK WILL CONNECT ALL THE GILFORD SCHOOLS TO THE EXISTING VILLAGE SIDEWALKS. [06-16TE]
				2007	PE		
				2008	ROW		
				2010	CON		
ATT	3259	GORHAM				NH 16	BRIDGE REPLACEMENT OVER PEABODY RIVER - 092/058
				2010	PE		
ATT	3265	GORHAM				US 2 / NH 16	INTERSECTION SAFETY IMPROVEMENTS (EASTERN INTERSECTION)
				2008	PE		
				2009	PE		
ATT	101	GORHAM	10438			NH 16	RECONSTRUCT FROM JUST NORTH OF MARTINS LOCATION NORTH 1.1 MILES
				2009	PE		
				2010	PE		
					ROW		
ATT	6148	GORHAM	14204A			US 2	INSTALL RWIS AT PATROL SHED IN DISTRICT 1 (JEFFERSON)
				2007	CON		
E-51	2752	GREENLAND				NH 33	INTERSECTION IMPROVEMENTS @ OCEAN ROAD, ADDING ADDITIONAL TURNING AND THROUGH LANES
				2008	PE		
				2010	PE		
N/E	6222	GREENLAND	06-08CM				TRUCKSTOP ELECTRIFICATION [06-08CM]
				2007	PE		
				2008	ROW		
				2010	CON		
E-19	3632	HAMPTON	13676B			NH 1A	REMOVAL OF LEAD PAINT & COMPLETE REPAINTING OF BASCULE SPAN OF HAMPTON RIVER BRIDGE - 235/025
				2008	CON		
E-33	3729	HAMPTON	13891			HIGH ST / TOWLE AVE / WINNACUNNET RD	PHASE 3 OF NORTH HAMPTON, HAMPTON AND EXETER REGIONAL BIKE LOOP: CONSTRUCT 4' SHOULDERS AND PAVEMENT MARKINGS FROM US 1 ALONG HIGH STREET, TOWLE AVENUE, AND WINNACUNNET ROAD TO NH 1A [02-23TE]
				2007	PE		
					ROW		
				2008	CON		
E-19	3263	HAMPTON	14188			NH 1A	BRIDGE REHABILITATION REPLACING DECK AND FENDER SYSTEM OVER HAMPTON RIVER - 235/025 [Section 1702 - Designated Project; Demo Id NH050] [Sister Demo Id NH067 & NH073]
				2008	ROW		
					CON		

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E-34	6048	HAMPTON FALLS - HAMPTON	13408B			I-95	REPLACEMENT OF THE TAYLOR RIVER BRIDGE ON THE BLUE STAR HIGHWAY AND REPLACEMENT OR REMOVAL OF THE TAYLOR RIVER DAM IN HAMPTON AT MILE 3.6501
				2007	PE		
					ROW		
				2008	PE		
				2009	PE		
					ROW		
				2010	CON		
ATT	2786	HARTS LOCATION				US 302	REHABILITATE & UPGRADE FROM CARROLL/HARTS LOCATION T/L EASTERLY APPROX. 1.5 MILES
				2010	PE		
ATT	3746	HAVERHILL	13907			FOREST STREET	CONSTRUCT 2800 LF OF SIDEWALK IN THE VILLAGE OF WOODSVILLE [02-64TE]
				2007	CON		
ATT	99	HAVERHILL - BATH	10436			US 302	RECONSTRUCTION FROM JUNCTION @ NH 10 NORTHERLY APPROXIMATELY 1.8 MILES
				2007	PE		
					ROW		
				2008	PE		
					ROW		
				2009	PE		
					ROW		
				2010	ROW		
ATT	3731	HILLSBOROUGH	13893			US 202 / NH 9	STONE ARCH BRIDGE ENHANCEMENT PROJECT: SW & SE CORNERS OF THE INTERSECTION OF NH 9 / US 202: CONSTRUCT VISITOR'S KIOSK & SMALL PARKING AREA (6 SPACES), NEW TOP SURFACE FOR BRIDGE, PED/BIKE TRAILS LINKING SITE TO SURROUNDING BUSINESSES, CAUSEWAY FROM STON
				2007	CON		
ATT	2748	HINSDALE				NH 63	RECONSTRUCT TO IMPROVE SAFETY AND CONGESTION @ ASHUELOT RR OVERPASS CROSSING
				2008	PE		
				2009	PE		
					ROW		
				2010	PE		
ATT	6104	HINSDALE	14540N			NH 63	BEGINNING APPROX 1300 FEET NORTH OF NH 119 AND CONTINUING NORTH APPROX 1000 FEET; RECONSTRUCT / REPAIR OCT 2005 FLOOD DAMAGE
				2007	PE		
					ROW		
				2008	CON		
ATT	591	HINSDALE, NH - BRATTLEBORO, VT	12210			NH 119	REPLACE 2 BRIDGES OVER CONNECTICUT RIVER - 041/040 & 042/044, BY CONSTRUCTING A NEW BRIDGE 043/044 JUST DOWNSTREAM [Section 1602 - Designated Project; Demo Id NH018]
				2007	PE		
					ROW		
				2008	PE		
					ROW		
				2009	PE		
					ROW		
				2010	PE		
					ROW		
E-33	3010	HOLLIS	13488			MAIN STREET, ASH STREET, BROAD STREET	CONSTRUCT SIDEWALK ON MAIN ST, ASH ST, & BROAD ST [00-40TE]
				2007	CON		

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N/E	4107	HOOKSETT	12537A			US 3 / NH 28	WIDEN NORTH OF BENTON ROAD SOUTH 0.411 MILES TO THE INTERSECTION WITH MARTIN'S FERRY ROAD [Section 117 - Designated Project; Demo Id NH031]
				2007	PE		
					ROW		
					CON		
				2008	PE		
					ROW		
					CON		
N/E	5683	HOOKSETT	14320			CONNECTOR ROAD	BUILD A CONNECTOR ROAD BETWEEN US 3 / NH 28 AND MERRIMACK STREET INCLUDING INTERSECTION IMPROVEMENTS
				2007	CON		
ATT	3197	HOPKINTON	13483A			NH 103 & NH 127	RESTORE COVERED RR BRIDGE NEAR THE INTERSECTION FOR WALK THROUGH MUSEUM IN THE VILLAGE OF CONTOOCOOK [Part of 00-17TE]
				2007	CON		
ATT	6145	HOPKINTON - HENNIKER	14559			US 202 / NH 9	TO EVALUATE SAFETY ISSUES WITH THE CORRIDOR AND MAKE RECOMMENDATION FROM I-89 INTERCHANGE TO NH 114
				2007	PE		
					ROW		
N/E	6223	HUDSON	06-10CM				TRAFFIC SIGNAL COORDINATION SYSTEM PHASE II [06-10CM]
				2007	PE		
				2008	ROW		
				2010	CON		
N/E	2086	HUDSON	10625O			CIRCUMFERENTIAL HWY	CONSTRUCTION OF MITIGATION SITE AT BENSON'S - PHASE 1
				2016	CON		
N/E	2087	HUDSON	10625Q			CIRCUMFERENTIAL HWY	CONSTRUCT BRIDGES (5), OLD DERRY ROAD, BARRETT'S HILL ROAD, GLOVER BROOK - PHASE 3
				2016	CON		
N/E	2088	HUDSON	10625R			CIRCUMFERENTIAL HWY	CONSTRUCT MAINLINE & RAMPS, NH 102 TO NH 111, & ROADWAY @ NH 111 - PHASE 3
				2016	CON		
N/E	3161	HUDSON	10625S			CIRCUMFERENTIAL HWY	CLEAN UP AND CLOSURE OF MITIGATION SITE AT BENSON'S
				2008	CON		
E-33	2298	HUDSON	13100			NH 3A	CONSTRUCT SIDEWALKS FROM BIRCH STREET TO CENTRAL STREET [98-23TE]
				2007	CON		
E-33	3732	HUDSON	13894			NH 102	CONSTRUCT 4,000 LF OF 5' WIDE BITUMINOUS SIDEWALK ON ONE SIDE & CONSTRUCT 4,000 LF OF 4' WIDE BITUMINOUS & BICYCLE LANE ON ONE SIDE: LOCATED ON THE EAST SIDE OF NH 102 BETWEEN EVERGREEN DRIVE AND MEGAN DRIVE [02-27TE]
				2008	CON		
E-28	5646	HUDSON	14408			TRAIN DEPOT	HUDSON CENTER TRAIN STOP DEPOT - RELOCATION AND RESTORATION OF FORMER HUDSON CENTER TRAIN DEPOT, WORCESTER, NASHUA, & PORTLAND RAILROAD BUILT IN 1873 [04-25TE]
				2008	CON		
ATT	1886	JEFFERSON - RANDOLPH	13602			US 2	RECONSTRUCTION, SAFETY IMPROVEMENTS, & SHOULDER WIDENING FROM NH 115 INTERSECTION EAST APPROXIMATELY 5.0 MILES TO DURAND ROAD (PE & ROW ONLY)
				2008	ROW		
ATT	4211	JEFFERSON - RANDOLPH	13602A			US 2	RECONSTRUCTION, SAFETY IMPROVEMENTS, & SHOULDER WIDENING FROM JEFFERSON-RANDOLPH T/L EAST APPROX. 2.7 MILES TO DURAND ROAD (Construction Only)
				2008	CON		

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ATT	6036	JEFFERSON - RANDOLPH	13602B			US 2	RECONSTRUCTION, SAFETY IMPROVEMENTS & SHOULDER WIDENING FROM NH 115 INTERSECTION EAST APPROX. 2.3 MILES TO JEFFERSON / RANDOLPH T/L (Construction only)
				2010	CON		
ATT	6236	KEENE	06-20TE			CHESHIRE RAIL TRAIL	IMPROVE EXISTING TRAIL SURFACE AND REPAIR DRAINAGE FROM PITCHER STREET TO BRADFORD ROAD AND FROM BRADFORD ROAD TO WHITCOMB'S MILL ROAD. ADD A TRAILHEAD AT WHITCOMB'S MILL ROAD. [06-20TE]
				2007	PE		
				2008	PE		
					ROW		
				2010	CON		
ATT	5703	KEENE	13101A			PEDESTRIAN / BIKE PATH	CONSTRUCT BIKE/PED TRAIL FROM ISLAND STREET TO TRAIL CONNECTING WINCHESTER ST TO GILBO AVE [Part of 98-66TE]
				2007	ROW		
				2010	CON		
ATT	737	KEENE	13251			NH 101	RECONSTRUCT FROM 0.9 MILES WEST OF BRANCH ROAD (END OF KEENE-SWANZEY BYPASS PROJ.) TO THE MARLBOROUGH T/L - APPROX 2.0 MILES
				2009	PE		
					ROW		
				2010	PE		
					ROW		
DNA	6147	KEENE - MILFORD	13856A			NH 101	RWIS INSTALL; TEMPLE MOUNTAIN, DISTRICT 4 PATROL SHED
				2007	CON		
ATT	38	KEENE - SWANZEY	10309			NH 101	UPGRADE OF NH 9/10/12 & 101 [PE&ROW] [Section 1602 - Designated Project; Demo Id NH017]
				2007	PE		
					ROW		
				2008	PE		
					ROW		
				2009	PE		
					ROW		
				2010	PE		
					ROW		
ATT	5705	KEENE - SWANZEY	10309J			NH 9 / NH 10 / NH 12 / NH 101	INTERIM INTERSECTION IMPROVEMENTS AT 'T' INTERSECTION AND CONSTRUCTION OF FLOODPLAIN & WETLAND MITIGATION [Section 1702 - Designated Project; Demo Id NH049]
				2009	CON		
ATT	5706	KEENE - SWANZEY	10309K			NH 12/101	INTERIM INTERSECTION IMPROVEMENTS @ MAIN STREET
				2010	CON		
ATT	6189	KEENE - SWANZEY	10309P			NH 9/10/12/101	CONSTRUCTION OF MULTI-USE TRAIL BRIDGE OVER NH 12/101
				2009	CON		
ATT	6362	KEENE - SWANZEY	10309Q			692-694 MAIN ST	PARCEL 216 BUILDING DEMOLITION
				2007	ROW		
ATT	6237	LACONIA	06-22TE				PHASE 2, WINNIPESAUKEE OPECHEE WINNISQUAM (WOW) TRIAL: CONSTRUCT 1.0 MILES OF SHARED USE PATH IN THE RAILROAD CORRIDOR FROM MAIN STREET IN DOWNTOWN LACONIA TO THE BELMONT TOWN LINE. [06-22TE]
				2008	PE		
				2009	PE		
					ROW		
ATT	3734	LACONIA	13895			US 3 / NH 11B	LACONIA / WEIRS BEACH SIDEWALKS, CHAPTER LAW 223:11: CONSTRUCT 5' WIDE SIDEWALK ALONG US 3 FROM LAKE SIDE AVENUE TO TOWER ST & ALONG NH 11B [02-31TE]
				2007	CON		

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ATT	5647	LACONIA	14409				LACONIA - OPECHEE - WINNISQUAM (WOW) TRAIL PHASE 1 - CONSTRUCT 7040' (Segments 7-10) SHARED USE PATH FOR BICYCLES & PEDESTRIANS IN RAILROAD CORRIDOR FROM MAIN ST (Laconia) TO ELM ST (Lakeport) (Phase I: Laconia - Opechee - Winnisquam, Part of Winnipesauk
				2008	CON		
ATT	2768	LACONIA - MEREDITH				US 3	REHABILITATE & ADD SHOULDERS FROM NH 104 SOUTHERLY 3.7 MILES TO WEIRS BEACH
				2008	PE		
					ROW		
				2010	PE		
ATT	6238	LANCASTER	06-24TE			US 2 AND MECHANIC STREET	RECONSTRUCT 300 LF OF SIDEWALK ON US 2 / US 3 AND 900 LF ON MECHANIC STREET INCLUDING INSTALLATION OF 11 DRIVEWAY TIP-DOWNS. WIDEN TO 5' AND OVERLAY 460 LF OF ASPHALT SIDEWALK NEAR SOLDIER'S PARK. [06-24TE]
				2008	PE		
				2009	ROW		
				2010	CON		
ATT	1900	LEBANON				I-89	1" OVERLAY FROM EXIT 17 TO JUST SOUTH OF EXIT 20 (5.5 MILES) INCLUDES SLIP LINING TWIN 66" PIPES NORTH OF EXIT 17 AND BRIDGE JOINT REHAB [4R]; BRIDGES 158/114 & 156/117
				2008	PE		
				2009	PE		
				2010	PE		
ATT	1890	LEBANON	10034A			US 4 (MECHANIC STREET)	RECONSTRUCTION FROM HIGH STREET TO I-89 RAMPS INCLUDING REMOVAL OF CONCRETE UNDERBASE, INSTALLATION OF SIDEWALKS, AND UPGRADE OF STORM DRAINAGE SYSTEM
				2007	ROW		
				2008	PE		
				2009	PE		
				2010	PE		
					ROW		
ATT	222	LEBANON	11700			I-89	RECONSTRUCTION OF THE INTERCHANGE & BRIDGES @ EXIT 20, INCLUDING APPROACHES ON NH 12A
				2007	PE		
					ROW		
				2008	PE		
				2009	CON		
ATT	3011	LEBANON	13491			US 4	BIKE & PEDESTRIAN IMPROVEMENTS ALONG US 4 NEAR I-89, EXIT 19 [00-52TE]
				2007	CON		
ATT	5583	LEBANON	13558A			NH 12A	BRIDGE REPLACEMENT OVER B&M RAILROAD - 062/117
				2007	PE		
					ROW		
				2008	PE		
					ROW		
ATT	1875	LEBANON	13951			US 4	BRIDGE REPLACEMENT OVER MASCOMA RIVER & NHRR - 188/126 NEAR INTERSECTION OF US 4 AND NH 4A
				2008	PE		
					ROW		
				2009	PE		
ATT	5582	LEBANON	14194			US 4	BRIDGE REHABILITATION OVER B&M RAILROAD / MASCOMA RIVER - 077/107
				2007	PE		
					ROW		
				2010	CON		
ATT	7778	LEBANON	14566			NHRR	REHABILITATE BRIDGE OVER CT RIVER - 060/122 (RR 142.74)
				2007	CON		

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ATT	2784	LINCOLN				I-93	COLD PLANE & OVERLAY WITH FABRIC & 2" PAVEMENT FROM US 3 BRIDGE TO WHITEHOUSE BRIDGE (6 MILES) [4R]
				2010	PE		
ATT	3254	LINCOLN				I-93	RECLAIM AND OVERLAY FROM EXIT 32 TO EXIT 33 (2 MILES) [4R]
				2009	PE		
				2010	PE		
ATT	2758	LISBON				US 302	REHABILITATE, BEGINNING 1100 FT NORTH OF PERCH POND ROAD NORTHERLY 4 MILES
				2008	PE		
				2009	PE		
					ROW		
ATT	5555	LISBON	14464			US 302	BRIDGE REHABILITATION OVER AMMONOOSUC RIVER - 094/114
				2007	PE		
					ROW		
				2010	CON		
N/E	2740	LITCHFIELD				ALBUQUERQUE AVE	CONSTRUCT .3 MILE SEGMENT FROM APRIL DRIVE TO NH 3A, INCLUDING INTERSECTION IMPROVEMENTS @ NH 3A
				2007	PE		
				2010	ROW		
				2011	CON		
N/E	3280	LITCHFIELD				ALBUQUERQUE AVE	NEW CONSTRUCTION OF ALBUQUERQUE AVENUE WITH LIMITS TO BE DETERMINED IN COORDINATION WITH THE TOWN IN THE FUTURE
				2010	PE		
				2015	CON		
E-45	6239	LITCHFIELD	06-26TE			ALBUQUERQUE AVENUE	ALBUQUERQUE AVENUE TRAIL COMPLETION: CONSTRUCT 0.85 MILES AND 0.95 MILES OF PEDESTRIAN BIKEWAY ADJACENT TO ALBUQUERQUE AVENUE. [06-26TE]
				2007	PE		
				2008	PE		
				2009	ROW		
N/E	125	LITCHFIELD	10625T			NH 3A (Circumferential Hwy)	CONSTRUCT INDUSTRIAL DRIVE, OFF NH 3A
				2014	CON		
N/E	2089	LITCHFIELD - HUDSON	10625K			CIRCUMFERENTIAL HWY	CONSTRUCT MAINLINE, RAMPS, TOLL BOOTH, NH 3A IMPROVEMENTS, BOAT RAMP ACCESS ROAD - PHASE 1
				2014	CON		
N/E	2091	LITCHFIELD - HUDSON	10625P			CIRCUMFERENTIAL HWY	CONSTRUCT MAINLINE & RAMPS FROM NH 3A TO NH 102 - PHASE 2
				2014	CON		
N/E	2090	LITCHFIELD - NASHUA	10625H			CIRCUMFERENTIAL HWY	CONSTRUCT NORTHERN RIVER CROSSING OVER MERRIMACK RIVER (2 BRIDGES) - PHASE 1
				2014	CON		
ATT	3786	LITTLETON	13861			MAIN STREET	PEDESTRIAN IMPROVEMENTS AND IMPLEMENTATION OF PROJECTS AND RECOMMENDATIONS DEVELOPED THROUGH LITTLETON - PHASE I, TCSP PROJECT TO INCLUDE ROADWAY RECONSTRUCTION
				2008	CON		
ATT	3736	LITTLETON	13897			RIVERFRONT PATHWAY & TRANSPORTATION MUSEUM	PHASE II: CONSTRUCT 200' PATH FROM END OF PHASE I TO SOLOMON BLOCK. CONSTRUCT 100' CANTILEVERED STRUCTURE FROM PATH TO COTTAGE ST BRIDGE. CONSTRUCT 65' STRUCTURE UNDER COTTAGE ST FROM EAST SIDE OF COTTAGE ST BRIDGE, CONSTRUCT PATH TO CONNECT WITH OPERA
				2008	CON		

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ATT	5773	LITTLETON	14307			REDINGTON STREET	BRIDGE REPLACEMENT OVER AMMONOOSUC RIVER - 232/050
				2008	PE		
				2009	PE		
					ROW		
					CON		
N/E	3275	LONDONDERRY				NH 28 & NH 128	INTERSECTION IMPROVEMENTS, FOR SAFETY AND TRAFFIC FLOW
				2009	PE		
				2012	ROW		
				2015	CON		
N/E	3703	LONDONDERRY	13872			VARIOUS	CONSTRUCT APPROX. 6200' OF MULTIPURPOSE PATH & SIDEWALK: BEGINNING @ PILLSBURY & WILSHIRE RDS TO MAMMOTH RD & CONTINUE AS AN INDEPENDENT MULTI-USE PATH [02-16CM]
				2007	CON		
E-21	6292	LONDONDERRY - SALEM				TRANSIT	COMMUTER BUS PREVENTATIVE MAINTENANCE
				2007	UNK		
				2008	UNK		
				2009	UNK		
				2010	UNK		
E-33	5648	MADBURY	14410				CENTER/CIVIC DISTRICT MULTI-USE PATHS - CONSTRUCT BIKE/PED PATHS TO TOWN SQUARE, TOWN CENTER/CIVIC DISTRICT BOUNDED ON SOUTH BY NH155 & NORTH BY TOWN HALL RD. ELEMENTARY SCHOOL LINKED WITH TOWN LIBRARY, ATHLETIC FIELDS, TOWN HALL. [04-31TE]
				2007	PE		
				2008	CON		
ATT	1210	MADISON - CONWAY	11339J			NH 16	CONWAY BYPASS SOUTHERN SEGMENT, EARTHWORK PROJECT
				2008	CON		
				2010	CON		
N/E	2745	MANCHESTER				FEE TPK	RECONSTRUCT INTERCHANGE AT EXIT 7 TO BECOME FULL INTERCHANGE
				2010	PE		
				2011	PE		
					ROW		
				2016	CON		
E-30	3062	MANCHESTER				TRANSIT AUTHORITY	REPLACEMENT BUSES
				2007	UNK		
				2008	UNK		
				2010	UNK		
E-19	3294	MANCHESTER				I-293 / FEE TPK	ROADWAY RECONSTRUCTION AND BRIDGE REHABILITATION BETWEEN NH 101 AND GRANITE STREET: 144/066, 146/064, 146/065, 149/063, 153/061
				2007	PE		
				2008	PE		
				2009	PE		
				2010	PE		
E-21	5916	MANCHESTER				TRANSIT AUTHORITY	OPERATING ASSISTANCE FOR ADA PARATRANSIT SERVICE
				2007	UNK		
				2008	UNK		
				2009	UNK		
				2010	UNK		

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E-30	5917	MANCHESTER				TRANSIT AUTHORITY	REPLACEMENT OF ADA PARATRANSIT VANS
				2007	UNK		
				2010	UNK		
E-30	5919	MANCHESTER				TRANSIT AUTHORITY	REPLACEMENT OF TRANSIT SERVICE VEHICLES
				2009	UNK		
E-21	5920	MANCHESTER				TRANSIT AUTHORITY	TRANSIT FACILITY IMPROVEMENT / SHOP EQUIPMENT REPLACEMENT
				2008	UNK		
				2010	UNK		
E-21	5921	MANCHESTER				TRANSIT AUTHORITY	TRANSIT OFFICE EQUIPMENT / MIS HARDWARE / SOFTWARE
				2009	UNK		
N/E	6224	MANCHESTER	06-12CM				INCREASED TRANSIT SERVICE [06-12CM]
				2009	CON		
E-33	2995	MANCHESTER	13493				REFURBISH UTILITY BRIDGE FOR TRAILWAY CONNECTION [00-59TE]
				2007	CON		
N/E	2968	MANCHESTER	13512				CONSTRUCT 600 SPACE PARK'N RIDE STRUCTURE [00-13CM]
				2010	PE		
				2011	PE		
				2012	ROW		
				2016	CON		
E-19	4255	MANCHESTER	14170			ISLAND POND ROAD	BRIDGE REPLACEMENT OVER I-93 - 166/124 & 166/125 AND SOUND WALL
				2007	PE		
					ROW		
E-33	5649	MANCHESTER	14411			ROCKINGHAM RECREATIONAL TRAIL	IMPROVEMENTS TO DEVELOP FORMER MANCHESTER & PORTSMOUTH BRANCH RAILROAD FOR BICYCLES & PEDESTRIAN ACCESS FROM TARRYTOWN RD SOUTH TO LAKE MASSABESIC. ALSO INCLUDES CONSTRUCTION OF A PEDESTRIAN CULVERT AT PEABODY AVE. [04-32TE]
				2008	PE		
				2009	CON		
E-33	5650	MANCHESTER	14412			PHASE III - RAILROAD	PISCATAQUOG TRAILWAY PHASE III - IMPROVE RAIL CORRIDOR FROM BIRON BRIDGE TO THE CITY/TOWN LINE WITH GOFFSTOWN. REHABILITATE WOOD TRESTLE BRIDGE OVER THE PISCATAQUOG RIVER. THIS IS THE FINAL PHASE OF A 3 PHASE PROJECT. [04-33TE]
				2007	PE		
				2008	CON		
E-4	2736	MANCHESTER - HOOKSETT - BOW	13917			NH 3A	SAFETY IMPROVEMENTS, INCLUDING SHOULDER WIDENINGS & INTERSECTION IMPROVEMENTS FROM I-293 EXIT 7 TO I-89
				2007	PE		
				2008	PE		
				2010	PE		
E-45	3737	MANCHESTER - WEARE	13898				PHASE 2: DEVELOPMENT OF THE FORMER MANCHESTER & NO. WEARE RAILROAD INTO AN ALTERNATIVE TRANS. SYSTEM & REC. TRAIL; CONSTRUCT REMAINING 1.3 MILES ABANDONED RAILROAD IN MANCHESTER WHICH EXTENDS FROM WEST SIDE OF SO. MAIN ST TO GOFFSTOWN [02-38TE]
				2007	CON		
ATT	3271	MARLBOROUGH				NH 101	IMPROVEMENTS FROM RYAN ROAD TO JEWETT STREET
				2008	PE		
				2009	PE		
					ROW		

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ATT	3527	MEREDITH				NH 106	RECONSTRUCT & ADD 4' SHOULDERS FROM LACONIA T/L TO NEW US 3 INTERSECTION - APPROX. 2.0 MILES
				2008	PE		
					ROW		
ATT	94	MEREDITH	10430			NH 25	RECONSTRUCTION FROM CENTER HARBOR TOWN LINE SOUTH 3.2 MILES TO PLEASANT STREET APPROXIMATELY [Section 1702 - Designated Project; Demo Id NH041] [Sister Demo Id NH060 & NH071]
				2007	PE		
					ROW		
				2008	PE		
					ROW		
				2009	PE		
					ROW		
				2010	CON		
N/E	3279	MERRIMACK				US 3	CAPACITY IMPROVEMENTS TO IMPROVE TRAFFIC FLOW AT A NUMBER OF INTERSECTIONS AS IDENTIFIED IN RECENT STUDIES COMPLETED BY THE TOWN OF MERRIMACK
				2010	PE		
				2015	CON		
N/E	2096	MERRIMACK	10625N			CIRCUMFERENTIAL HWY	CONSTRUCT MAINLINE, US 3 TO EXIT 9 & BRIDGES (2)
				2016	CON		
E-19	337	MERRIMACK	12105			CENTRAL TPK	BRIDGE REHABILITATION & SAFETY WORK ON FEE TPK NB & SB OVER SOUHEGAN RIVER - 111/115
				2008	CON		
N/E	425	MERRIMACK	12259			US 3	PARK'N'RIDE, 250 SPACES - INTERMODAL FACILITY NEAR RR FACILITY, FEE Tpk, AND US 3 [94-40CM]
				2014	CON		
E-33	3001	MERRIMACK	13494			D.W. HWY	CONSTRUCT 2400' SIDEWALK ON EAST SIDE OF ROAD (DW Hwy) FROM FRAZIER SQUARE TO TWIN BRIDGE PARK [00-62TE]
				2007	CON		
E-33	5651	MERRIMACK	14413			DW HIGHWAY	CONSTRUCT SIDEWALKS ALONG DW HIGHWAY IN TOWN CENTER (WEST SIDE) TO FILL SEVERAL GAPS IN EXISTING SIDEWALK SYS. PROVIDE CROSSWALKS TO IMPROVEMENTS PLANNED FOR THE EAST SIDE. [04-36TE]
				2008	PE		
				2009	CON		
N/E	3662	MERRIMACK - BEDFORD	13761			F.E.E.Tpk	WIDEN TURNPIKE TO A 3 LANE TYPICAL FROM EXIT 11 IN MERRIMACK TO THE BEDFORD TOLL PLAZA TO MEET CURRENT AND PROJECTED VOLUME
				2012	PE		
				2013	ROW		
				2015	CON		
N/E	2099	MERRIMACK - NASHUA	10625I			CIRCUMFERENTIAL HWY	CONSTRUCT BRIDGES (4), MAINLINE & RAMPS OVER PENNICHUCK BROOK - PHASE 1
				2014	CON		
N/E	2100	MERRIMACK - NASHUA	10625M			CIRCUMFERENTIAL HWY	CONSTRUCT FOR NHCH & FEE TPK: MAINLINE, RAMPS, & BRIDGES (5) @ EXIT 9 INTERCHANGE - PHASE 1
				2016	CON		
ATT	3264	MILAN - DUMMER				NH 16	UPGRADE ROADWAY FROM SOUTH OF MILAN VILLAGE NORTH TO DUMMER / CAMBRIDGE / ERROL PROJECT - RECONSTRUCT BASE TO NEGATE NEED FOR SPRING ROAD BAN & ADD 5' SHOULDERS
				2008	PE		
				2009	PE		
					ROW		

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E-45	6240	MILFORD	06-28TE			SOUTH STREET	SOUTH STREET IMPROVEMENT PROJECT: CONSTRUCT THE PHASE 2 PORTION OF THE DOWNTOWN REVITALIZATION PLAN TO IMPROVE OVERALL SAFETY, PHYSICAL / ADA ACCESSIBILITY, FUNCTIONALITY, DESIGN AND GENERAL AESTHETIC OF THE INTERSECTION. [06-28TE]
				2007	PE		
				2008	PE		
				2009	ROW		
				2010	CON		
E-10	3278	MILFORD	14492			NH 101A & NH 13	IMPROVEMENTS IN THE AREA KNOWN AS THE "OVAL" TO IMPROVE TRAFFIC FLOW BASED ON RESULTS OF ONGOING TRAFFIC STUDIES WITHIN THE TOWN [Section 1702 - Designated Project; Demo Id NH038] [Sister Demo Id NH058]
				2007	PE		
				2008	PE		
					ROW		
E-53	730	MILFORD TO NASHUA	10136			NH 101A	ROADWAY IMPROVEMENTS FROM NH 101 TO FEE TPK (7.5 MILES); CONSTRUCTION PROJECTS TO BE DETERMINED BY CORRIDOR STUDY
				2007	PE		
					ROW		
				2008	PE		
					ROW		
				2009	PE		
					ROW		
				2010	CON		
ATT	2737	MOULTONBOROUGH				NH 25	ROADWAY RECONSTRUCTION FROM MOULTONBOROUGH NECK ROAD EASTERLY 3.5 MILES TO NH 109 SOUTH TO INCLUDE THE RECONSTRUCTION OF THE INTERSECTION OF NH 25 AND NH 109 NORTH
				2008	PE		
				2009	PE		
					ROW		
				2010	PE		
N/E	3536	NASHUA				EAST HOLLIS STREET	RECONSTRUCTION OF EAST HOLLIS STREET FROM MAIN STREET TO HUDSON TOWN LINE TO IMPROVE CAPACITY
				2008	PE		
				2009	PE		
				2010	PE		
				2011	PE		
				2013	ROW		
					CON		
N/E	4047	NASHUA				FEE Tpk	NEW SOUTH BOUND OFF RAMP @ MA. EXIT 36 TO CONNECT WITH DW Hwy & PHEASANT LANE MALL (1.9 Miles) (Feasibility Study)
				2014	PE		
N/E	6225	NASHUA	06-13CM				INCREASED TRANSIT SERVICE [06-13CM]
				2009	CON		
E-45	6241	NASHUA	06-30TE				RAIL TRAIL ACQUISITION FROM MAIN STREET TO EAST HOLLIS STREET : PURCHASE THE REMAINING ABANDONED RAILROAD CORRIDOR THAT INCORPORATES WALKING AND BIKING FACILITIES, AND POSSIBLY MASS TRANSIT IN THE FUTURE. [06-30TE]
				2007	ROW		

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N/E	18	NASHUA	10040A			BROAD STREET PARKWAY	SECOND RIVER BRIDGE CROSSING OVER NASHUA RIVER [Section 1602 - Designated Project; Demo Id NH003] [Sister Demo Projects: 10040A, G, H, J, S, T]
				2007	PE		
					ROW		
				2008	PE		
					ROW		
				2009	PE		
					ROW		
				2010	PE		
					ROW		
N/E	2641	NASHUA	10040G			BALDWIN STREET	RECONSTRUCTION AND EXTENSION FROM AMHERST STREET, OVER B&M RAILROAD AND THE FUTURE BROAD STREET PARKWAY TO FAIRMOUNT STREET, WITH CONNECTOR TO FUTURE PARKWAY
				2010	CON		
N/E	2642	NASHUA	10040H			BROAD STREET PARKWAY	CONSTRUCTION FROM NASHUA RIVER WESTERLY TO BROAD STREET (TO SUBGRADE ONLY)
				2009	CON		
N/E	2643	NASHUA	10040I			BROAD STREET PARKWAY	CONSTRUCTION OF BRIDGE OVER NASHUA RIVER; FAIRMOUNT STREET BRIDGE OVER PARKWAY
				2012	CON		
N/E	2647	NASHUA	10040J			BROAD STREET PARKWAY	CONSTRUCTION FROM WEST HOLLIS STREET TO PINE STREET EXTENSION INCLUDING BRIDGE OVER CANAL
				2010	CON		
N/E	2648	NASHUA	10040K			BROAD STREET PARKWAY	BASE COURSES, WEARING COURSES, SIGNING, MARKINGS, RR CROSSING, AND SIGNALS
				2012	CON		
N/E	2649	NASHUA	10040L			BROAD STREET PARKWAY	PROJECT WIDE LANDSCAPING
				2013	CON		
DNA	2645	NASHUA	10040M			BROAD STREET PARKWAY	CHIMNEY STABILIZATION
				2008	CON		
N/E	2644	NASHUA	10040P			BROAD STREET PARKWAY	BUILDING DEMOLITION PROJECT WIDE (TO CONSTRUCT SECOND BRIDGE CROSSING OF NASHUA RIVER)
				2007	ROW		
N/E	3752	NASHUA	10040S			BROAD STREET PARKWAY	DEMOLITION OF "NIMCO" BUILDING
				2008	ROW		
				2009	ROW		
				2010	ROW		
N/E	3753	NASHUA	10040T			BROAD STREET PARKWAY	MILLYARD UTILITY RELOCATION
				2009	ROW		
N/E	3593	NASHUA	10136A			NH 101A	WIDENING BETWEEN CELINA AVENUE INTERSECTION TO AMHERST STREET MALL INTERSECTION (1.5 MILES) TO EXPAND FROM EXISTING FIVE LANES TO SEVEN LANES AS RECOMMENDED BY CORRIDOR STUDY (Milford to Nashua 10136)
				2007	PE		
				2008	PE		
				2009	ROW		
				2010	CON		
N/E	2344	NASHUA	13117			FEE TPK	CONSTRUCT 1000 SPACE PARK'N'RIDE NEAR B&M RR WITH RAIL PLATFORM; FACILITY WILL BE USED FOR CAR POOL, VANPOOL, & PASSENGER RAIL MODES [98-13CM]
				2007	PE		
					ROW		
					CON		
				2008	CON		

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E-21	2964	NASHUA	13513			TRANSIT	EXPANSION BUS SERVICE [00-15CM]
				2007	CON		
N/E	2959	NASHUA	13514				PURCHASE COMMUTER RAIL EQUIPMENT [00-12CM]
				2008	CON		
				2009	CON		
N/E	3698	NASHUA	13875				PROVIDE 3 YEARS OPERATING SUPPORT FOR LOWELL - NASHUA COMMUTER RAIL STARTUP [02-22CM]
				2008	PE		
				2009	PE		
				2010	PE		
E-53	3277	NASHUA	13931			NH 130	BROAD STREET RECONSTRUCTION FROM COBURN AVE TO COLISEUM AVE, INCLUDING DUBLIN AVE, TO PROVIDE SHOULDERS / SAFETY IMPROVEMENTS
				2007	PE		
				2008	PE		
				2009	PE		
					ROW		
				2010	CON		
N/E	5621	NASHUA	14432			VARIOUS	TRAFFIC SIGNALS, EXPAND THE CLOSED LOOP SYSTEM TO INCLUDE THIRTY ADDITIONAL INTERSECTIONS [04-30CM]
				2009	PE		
				2010	CON		
N/E	126	NASHUA - HUDSON	10644			CIRCUMFERENTIAL HWY	DESIGN NORTH SEGMENT BETWEEN NH 111 & FEE TURNPIKE: PHASE 1 - R.O.W. SEGMENT NH 3A TO FEE TURNPIKE; PHASE 2 - R.O.W. SEGMENT NH 3A TO NH 102; PHASE 3 - R.O.W. SEGMENT NH 102 TO NH 111
				2007	PE		
					ROW		
				2008	PE		
					ROW		
				2009	PE		
					ROW		
				2010	PE		
					ROW		
				2012	PE		
				2013	PE		
					ROW		
				2014	PE		
					ROW		
				2015	PE		
					ROW		
				2016	PE		
					ROW		
N/E	2082	NASHUA - MERRIMACK	10625L			CIRCUMFERENTIAL HWY	CONSTRUCT MAINLINE, RAMPS, US 3 ROADWAY IMPROVEMENTS & BRIDGES (2) - PHASE 1
				2016	CON		
N/E	3162	NASHUA - MERRIMACK	10625U			F.E.E.Tpk	WIDENING TO CIRCUMFERENTIAL HWY NORTH
				2014	CON		
ATT	6242	NEW BOSTON	06-34TE				MILLPOND FOOTBRIDGE: CONSTRUCT STEEL TRUSS BRIDGE WITH A SPAN OF 110' AND A WIDTH OF 6'. A BOARDWALK WILL BE CONSTRUCTED LEADING UP TO THE BRIDGE. [06-34TE]
				2007	PE		
				2008	PE		
				2009	ROW		
				2010	CON		

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ATT	6344	NEW BOSTON	14772			US 202	RECONSTRUCTION FROM NH 101 INTERSECTION NORTH 2.5 MILES
				2007	PE		
				2009	PE		
				2010	PE		
					ROW		
E-45	6243	NEW CASTLE	06-35TE			NH 1B	CONSTRUCT SIDEWALK BETWEEN RESIDENTIAL NEIGHBORHOODS AND THE ELEMENTARY SCHOOL (300 LF) AND BETWEEN THE GREAT COMMON (LIBRARY/PARK/BEACH) AND THE WENTWORTH HOTEL (1,150 LF). [06-35TE]
				2007	PE		
				2008	PE		
				2009	ROW		
				2010	CON		
ATT	3699	NEW HAMPTON	13876			NH 104	EXIT 23 PARK'N'RIDE EXPANSION [02-24CM]
				2007	CON		
ATT	3267	NEW HAMPTON - MEREDITH				NH 104	RECONSTRUCTION FROM I-93 TO MEREDITH CENTER RD. TO IMPROVE HORIZONTAL AND VERTICAL ALIGNMENT AND TO WIDEN SHOULDERS [APPROX. 4 MILES]
				2008	PE		
				2009	PE		
					ROW		
				2010	PE		
ATT	2757	NEW IPSWICH	14465			NH 123 / 124	REPLACE BRIDGE OVER SOUHEGAN RIVER - 157/093
				2007	PE		
				2008	ROW		
				2010	CON		
ATT	3526	NEW LONDON				NH 114 (Main St)	RECONSTRUCTION, NH 11 (CROCKETT'S CORNER) NORTHERLY TO NEWPORT ROAD (HOMAN'S CORNER)
				2010	PE		
					ROW		
ATT	5653	NEW LONDON	14415			NEWPORT RD / COUNTY RD	INSTALL 800' SIDEWALK NORTH SIDE OF NEWPORT RD, INSTALL 1000' SIDEWALK WEST SIDE OF COUNTY RD. INTERSECTION IMPROVEMENTS (Traffic Signal or Modern Roundabout) [04-46TE]
				2007	ROW		
					CON		
ATT	6244	NEWBURY	06-38TE			NH 103	LAKE SUNAPEE WATERFRONT PEDESTRIAN IMPROVEMENTS: NH 103 SIDEWALK AND LIGHTING IMPROVEMENTS LINKING TOWN AMENITIES. [06-38TE]
				2007	PE		
				2008	PE		
					ROW		
				2010	CON		

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N/E	1191	NEWINGTON - DOVER	11238			NH 16 / US 4 / SPLDG TPK	WIDEN TURNPIKE INCLUDING LITTLE BAY BRIDGES FROM GOSLING ROAD TO DOVER TOLL
				2007	PE		
				2008	PE		
					ROW		
				2009	PE		
					ROW		
				2010	PE		
					ROW		
					CON		
				2011	CON		
				2012	CON		
				2013	CON		
				2014	CON		
				2015	CON		
N/E	5935	NEWINGTON - DOVER	11238J			SPLDG TPK / NH 16 / US 4	WIDEN TURNPIKE INCLUDING LITTLE BAY BRIDGES FROM GOSLING ROAD TO DOVER TOLL
				2007	ROW		
N/E	6138	NEWINGTON - DOVER	11238K			NH 16 / US 4 / SPAULDING TURNPIKE	RECONFIGURATION AND RELOCATION OF RAMPS AND ACCESS (To provide matching funds only to the federally-funded portion of the 11238 project for PE, ROW & Construction)
				2007	PE		
					ROW		
				2008	PE		
					ROW		
				2009	PE		
					ROW		
					CON		
				2010	PE		
					ROW		
					CON		
E-33	3007	NEWMARKET	13499			MAIN STREET	RECONSTRUCT MAIN STREET TO IMPROVE PEDESTRIAN FACILITIES [00-73TE]
				2007	CON		
N/E	3708	NEWMARKET - NEWFIELDS	13878			NH 108	CONSTRUCT 4' BIKE SHOULDERS FROM THE SOUTHERLY LIMIT OF PROJECT 13107 IN NEWMARKET TO THE NORTHERLY LIMIT OF PROJECT P4386 IN NEWFIELDS [02-25CM]
				2007	CON		
ATT	6245	NEWPORT	06-40TE				HISTORIC PRESERVATION OF NATIONAL REGISTER RAIL BRIDGES: PROVIDE FIRE PROTECTION FOR TWO EARLY TWENTIETH CENTURY WOODEN COVERED RAILROAD BRIDGES. [06-40TE]
				2007	PE		
				2008	CON		
ATT	3013	NEWPORT	13500				REHABILITATE RR BRIDGE [00-76TE]
				2007	PE		
				2008	CON		
ATT	2749	NEWPORT - GOSHEN - LEMPSTER - MARLOW	13952			NH 10	RECONSTRUCT / REHABILITATE FROM NEWPORT TO NH 123A IN MARLOW (15.0 MI)
				2008	PE		
					ROW		
E-45	6246	NORTH HAMPTON	06-42TE			NH 111	SCHOOL ZONE SIDEWALK IMPROVEMENTS: CONSTRUCT 0.2 MILES OF SIDEWALK ALONG NH 111 CONNECTING ELEMENTARY SCHOOLS WITH THE TOWN AMENITIES. [06-42TE]
				2007	PE		
				2008	PE		
				2009	ROW		
				2010	CON		

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E-33	3014	NORTH HAMPTON	13501			NH 111	FROM INTERSECTION WITH HOBBS ROAD TO US 1, SHOULDER IMPROVEMENTS US 1 [00-77TE]
				2007	ROW		
					CON		
ATT	1814	NORTHFIELD	13596			I-93	COMPLETE EXIT 19
				2008	PE		
					ROW		
ATT	734	NORTHUMBERLAND	12990			US 3	RECONSTRUCTION, SOUTH FROM STRATFORD TOWN LINE, 1.4 MILES
				2010	PE		
ATT	1888	OSSIPEE	13910			NH 16, NH 25, NH 41	INTERSECTION IMPROVEMENTS IN WEST OSSIPEE AT THE INTERSECTION OF NH 16 AND NH 25 TO INCLUDE THE RELOCATION OF NH 41 TO THE INTERSECTION OF NH 16 AND NH 25 WEST
				2008	PE		
				2009	ROW		
				2010	PE		
					ROW		
ATT	2762	OSSIPEE	14749			NH 16/25	RECONSTRUCT ROADWAY AND REHABILITATE 4 BRIDGES, BEGINNING AT THE LOVELL RIVER BRIDGE, RUNNING NORTH 3.22 MILES TO THE CHOCORUA RIVER - 137/299, 137/297, 152/268, 123/324
				2009	PE		
					ROW		
				2010	PE		
ATT	3740	OSSIPEE - FREEDOM - EFFINGHAM	13901				SPUR OF OSSIPEE LAKE TRAIL: CONSTRUCT A 0.3 MILE FACILITY WITH A BIKE/PED UNDERPASS. THIS SPUR WILL CONNECT TO 23 MILE OSSIPEE LAKE TRAIL, STATEWIDE BIKE ROUTE SYSTEM AND DOT PROPOSED OSSIPEE MULTI MODAL TRANSPORTATION FACILITY [02-49TE]
				2007	PE		
					ROW		
				2008	CON		
E-51	4231	PELHAM	14491			NH 111A	IMPROVEMENTS TO TWO INTERSECTIONS: MAIN STREET / NASHUA ROAD AND OLD BRIDGE STREET / COMMON STREET [Section 1702 - Designated Project; Demo Id NH055] [Sister Demo Id NH072]
				2007	PE		
				2008	PE		
					ROW		
				2010	CON		
ATT	6049	PEMBROKE	14477A			US 3 / PEMBROKE HILL RD	INTERSECTION IMPROVEMENT PROJECT [Section 1702 - Designated Project; Demo Id NH042] [Sister Demo Id NH061]
				2007	PE		
					ROW		
				2008	PE		
					ROW		
				2009	PE		
					ROW		
				2010	CON		
ATT	2746	PETERBOROUGH				NH 101	RECONSTRUCT INTERSECTION @ NH 123/OLD STREET ROAD
				2010	PE		
ATT	2760	PETERBOROUGH				US 202	RECONSTRUCT FROM NH 101 NORTHERLY 2.5 MILES
				2007	PE		
				2009	PE		
				2010	PE		
					ROW		

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ATT	6140	PINKHAMS GRANT	14564				CONSTRUCT PEDESTRIAN FOOTBRIDGE OVER ELLIS RIVER IN PINKHAM NOTCH (ADJACENT TO NH 16 BR# 065/073) FOR IMPROVED ACCESS TO WHITE MOUNTAIN NATIONAL FOREST [Section 117 - Designated Project; Demo Id NH034] [Sister Demo Id NH035]
				2007	CON		
ATT	6141	PINKHAMS GRANT	14564A				CONSTRUCT PEDESTRIAN FOOTBRIDGE OVER ELLIS RIVER IN PINKHAM NOTCH (ADJACENT TO NH 16 BR# 065/073) FOR IMPROVED ACCESS TO WHITE MOUNTAIN NATIONAL FOREST [Section 117 - Designated Project; Demo Id NH035] [Sister Project - Demo Id NH034]
				2007	CON		
N/E	3897	PLAISTOW	10044D			NH 125	RECONSTRUCT INTERSECTION OF OLD COUNTY ROAD
				2007	CON		
N/E	6372	PLAISTOW	10044F			NH 125	RECONSTRUCT INTERSECTIONS& CONSTRUCT JUG HANDLES
				2010	CON		
E-51	2743	PLAISTOW	13803			NH 125	WIDENING FOR CENTER TURN LANES FROM THE MASSACHUSETTS S/L TO WESTVILLE BRIDGE
				2007	PE		
					ROW		
					CON		
N/E	24	PLAISTOW - KINGSTON	10044B			NH 125	RECONSTRUCTION FROM EAST ROAD IN PLAISTOW NORTHERLY APPROX. 6.0 +/- MILE TO NH 125 & MAIN STREET INTERSECTION IN KINGSTON
				2007	PE		
					ROW		
				2008	PE		
					ROW		
				2009	ROW		
				2010	CON		
				2011	CON		
				2012	CON		
				2013	CON		
N/E	3898	PLAISTOW - KINGSTON	10044E			NH 125	RECONSTRUCT INTERSECTION OF ROADSTONE DRIVE AND CONSTRUCT EXTENSION OF KINGSTON ROAD
				2008	CON		
N/E	2965	PLAISTOW, NH to HAVERHILL, MA	13515				CONSTRUCT RAIL PLATFORM & PROVIDE THREE YEARS OF OPERATING SUBSIDY FOR PASSENGER RAIL [00-20CM]
				2007	PE		
				2009	CON		
ATT	5654	PLYMOUTH	14416			NEWPORT ROAD	PLYMOUTH SENIOR CENTER: PHASE 2 - RENOVATE 2ND FLOOR OF THE FORMER B&M RAILROAD STATION CURRENTLY USED AS A REGIONAL SENIOR CENTER, A SCHEDULED STOP FOR THE HOBO RR AND MUSEUM FOR RAILROAD HISTORY IN THE AREA [04-52TE]
				2007	CON		
E-51	1893	PORTSMOUTH				US 1	INTERSECTION @ CONSTITUTION AVE AND ROADWAY IMPROVEMENTS
				2007	PE		
					ROW		
				2008	ROW		
E-10	3285	PORTSMOUTH				US 1	RECONSTRUCT FROM WILSON ROAD TO CONSTITUTION AVE
				2008	PE		
				2009	ROW		
E-19	141	PORTSMOUTH	10665			NH 33 (Old NH101)	REPLACE BRIDGE OVER B & M RR - 154/101
				2007	ROW		
					CON		
				2008	CON		

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E-33	1125	PORTSMOUTH	12683			BICYCLE ROUTE	CREATE SAFE BICYCLE ROUTE FROM DOWNTOWN PORTSMOUTH TO BIKE / PED BRIDGE INTO PEASE INTERNATIONAL TRADEPORT [96-17TE]
				2007	CON		
E-19	622	PORTSMOUTH	12900			US 1 BYPASS	RECONSTRUCT FROM TRAFFIC CIRCLE NORTH TO SARAH LONG BRIDGE INCLUDING BRIDGES 227/112, 211/114 & 205/116
				2007	PE		
					ROW		
				2008	PE		
					ROW		
				2009	PE		
					ROW		
				2010	PE		
					ROW		
E-19	2759	PORTSMOUTH	13455			US 1 BYPASS	RECONSTRUCT FROM SAGAMORE CREEK PROJECT TO TRAFFIC CIRCLE, INCLUDING BRIDGES 173/071, 183/087, 188/097, 189/100, 192/106
				2007	PE		
					ROW		
				2008	PE		
					ROW		
				2009	PE		
					ROW		
				2010	PE		
					ROW		
E-51	2961	PORTSMOUTH	13516			WOODBURY AVE / MARKET STREET	SIGNAL COORDINATION ALONG WOODBURY AVE FROM I-95 INTERCHANGE TO GOSLING ROAD [00-21CM]
				2008	CON		
E-33	3742	PORTSMOUTH	13903			BOW STREET	PISCATAQUA RIVERWALK: CONSTRUCT 400 LF OF PEDESTRIAN FACILITY AND PIER ALONG THE PISCATAQUA RIVER PARALLELING BOW STREET [02-53TE]
				2007	CON		
E-53	3284	PORTSMOUTH	14368			I-95	INTERCHANGE IMPROVEMENTS @ MARKET STREET
				2007	PE		
					CON		
E-19	5560	PORTSMOUTH	14376			I-95	PAINT BRIDGE APPROACHES TO BRIDGE OVER PISCATAQUA RIVER - 258/128
				2007	PE		
					ROW		
E-33	5655	PORTSMOUTH	14417			GRAFTON DRIVE	TRADE PORT MULTI-USE PATH - CONSTRUCT A MULTI USE PATH ALONG GRAFTON DR BETWEEN NH AVENUE AND PORTSMOUTH TRANSPORTATION CENTER, AND BETWEEN PEASE GOLF COURSE AND AIRPORT RD [04-54TE]
				2008	PE		
				2009	CON		
N/E	5617	PORTSMOUTH	14428			MARKET STREET EXTENSION	BIKE / PED PATH, BETWEEN MICHAEL SUCCI DRIVE AND THE NH PORT AUTHORITY [04-16CM]
				2007	PE		
					CON		
E-19	6053	PORTSMOUTH	14493			NH 1A	BRIDGE REHABILITATION OVER SAGAMORE CREEK - 198/034
				2007	PE		
				2008	PE		
				2009	PE		
					ROW		

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E-19	2756	PORTSMOUTH, NH - KITTERY, ME	13678			US 1	REHABILITATE BRIDGE OVER PISCATAQUA RIVER - 247/084 (Memorial Bridge) & REPLACE SCOTT AVENUE BRIDGE - 246/083
				2007	PE		
				2008	PE		
					ROW		
				2010	CON		
E-19	3556	PORTSMOUTH, NH - KITTERY, ME	13679			US 1	PAINT BRIDGE OVER PISCATAQUA RIVER - 247/084 (Memorial Bridge)
				2007	PE		
					ROW		
N/E	1724	ROCHESTER	10620D			SPAULDING TPK	CONSTRUCT 4 LANE TPK FROM EXIT 11/12 (NH 125) TO EXIT 16 (US 202) (PRELIMINARY ENGINEERING AND ROW ACQUISITIONS)
				2007	PE		
					ROW		
				2008	PE		
					ROW		
				2009	ROW		
N/E	2101	ROCHESTER	10620G			SPAULDING TPK	CONSTRUCTION OF EXIT 11 & 12 (NH 125) BRIDGE - 158/110, AND 2nd BARREL - PHASE 1
				2007	CON		
N/E	2103	ROCHESTER	10620H			SPAULDING TPK	CONSTRUCTION OF 2nd BARREL THROUGH EXIT 13 - PHASE 2 - 139/094
				2008	CON		
				2009	CON		
N/E	2104	ROCHESTER	10620I			SPAULDING TPK	CONSTRUCTION OF 2nd BARREL THROUGH EXIT 14 AND EXIT 15 - PHASE 3
				2009	CON		
				2010	CON		
N/E	2105	ROCHESTER	10620J			SPAULDING TPK	CONSTRUCTION OF 2nd BARREL THROUGH EXIT 16 (Chestnut Hill Connector) - PHASE 4
				2012	CON		
				2013	CON		
N/E	3885	ROCHESTER	10620K			SPAULDING TPK	EXIT 11 & 12 (NH 125) BRIDGE - 157/110, AND 2ND BARREL - PHASE 2
				2008	CON		
				2009	CON		
N/E	3973	ROCHESTER	10620L			SPAULDING TPK	CONSTRUCTION OF 2ND BARREL THROUGH EXIT 14 & 15 - PHASE 3, PART B
				2011	CON		
				2013	CON		
E-51	2963	ROCHESTER	13517			NH 125	SIGNAL COORDINATION FROM BROCK STREET TO LOWELL STREET [00-23CM]
				2007	CON		
E-51	2750	ROCHESTER	14350			NH 202A (WALNUT STREET)	INTERSECTION IMPROVEMENTS TO IMPROVE SAFETY THROUGH STRAFFORD SQUARE, NORTH MAIN, & WASHINGTON STREETS
				2007	PE		
ATT	102	ROXBURY - SULLIVAN	10439			NH 9	RECONSTRUCT SHOULDERS & WIDEN FROM EAST SULLIVAN, SOUTH 2.04 MI; 093/061
				2007	PE		
				2008	PE		
					ROW		
				2009	PE		
					ROW		
				2010	PE		
					ROW		

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ATT	5755	RURAL OPERATIONAL SAFETY INITIATIVES	14300			VARIOUS	1) PURCHASE AND INSTALL PAVEMENT-EMBEDDED CROSSWALK LIGHTS; 2) PURCHASE PORTABLE MESSAGE BOARDS; 3) PURCHASE SPEED DISPLAY/TRAFFIC RECORDER TRAILERS
				2007	CON		
E-19	629	RYE	13269			NH 1A	REPLACE WOODEN BRIDGE OVER SEAVEY'S CREEK - 252/156, WITH WOODEN BRIDGE STRUCTURE
				2007	PE		
					ROW		
				2008	PE		
					ROW		
					CON		
E-53	630	SALEM	12334			NH 28	RECONSTRUCT INTERSECTION, MAIN STREET @ DEPOT STREET, INCLUDING SIGNALS, LEFT TURN LANES & APPROACHES
				2007	PE		
					ROW		
				2008	PE		
					ROW		
				2009	PE		
					ROW		
				2010	PE		
					ROW		
E-51	2960	SALEM	13518			PELHAM ROAD	SIGNAL COORDINATION FROM NORTH POLICY ROAD WEST TO STILES ROAD [00-24CM]
				2007	CON		
E-21	6114	SALEM	14430A				TRANSIT SERVICE FOR EMPLOYEES IN THE REGION CONNECTING SALEM TO OTHER COMMUNITIES WITH THE GOAL OF FIXED ROUTE TRANSIT [Part of 04-20CM]
				2007	PE		
E-30	3890	SALEM - DERRY				TRANSIT	DEMAND-RESPONSE TRANSIT EXPANSION & COORDINATION
				2007	UNK		
E-30	3892	SALEM - DERRY				TRANSIT	DEMAND-RESPONSE TRANSIT EXPANSION & COORDINATION
				2007	UNK		
E-21	2903	SALEM - MANCHESTER				TRANSIT	CAPITAL
				2008	UNK		
				2009	UNK		
				2010	UNK		
N/E	66	SALEM TO MANCHESTER	10418			I-93	I-93 RECONSTRUCTION AND MITIGATION
				2007	PE		
					ROW		
				2008	ROW		
E-38	69	SALEM TO MANCHESTER	10418C			I-93	ENVIRONMENTAL IMPACT STUDY AND FINAL DESIGN FROM MASS S/L IN SALEM TO I-293 IN MANCHESTER (PE & ROW Only) [Section 1602 - Designated Project; Demo Id NH014] [Sister Demo Id NH029 & NH051/NH076 & NH052/NH068]
				2007	PE		
					ROW		
					CON		
				2008	PE		
					ROW		
				2009	PE		
					ROW		
				2010	PE		
					ROW		

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N/E	1800	SALEM TO MANCHESTER	10418F	2012	CON	I-93	CONSTRUCTION OF WETLAND MITIGATION SITES IN ANTICIPATION OF WETLAND IMPACTS ASSOCIATED WITH FUTURE IMPROVEMENTS TO I-93 FROM SALEM TO MANCHESTER. INCLUDES: LONDONDERRY L-8, L-8 EXTENSION, L-12 SITES; & LONDONDERRY ADVANCE MITIGATION / WETLAND CREATION [
N/E	3137	SALEM TO MANCHESTER	10418G	2007	CON	I-93	PARK & RIDE @ EXIT 2 (Salem) [Part of 04-33CM]
N/E	3138	SALEM TO MANCHESTER	10418H	2010	CON	I-93	PARK & RIDE @ EXIT 3 (Windham) [Part of 04-33CM]
N/E	5613	SALEM TO MANCHESTER	10418L	2007	CON	I-93	IMPLEMENT EXPANDED BUS SERVICE & NEW COMMUTER INCENTIVE PROGRAM. PURCHASE 14 COMMUTER COACHES & PROVIDE 3 YEARS OF OPERATING SUPPORT [04-04CM]
E-28	5692	SALEM TO MANCHESTER	10418N	2007	CON	I-93	EXIT 5 BUS MAINTENANCE FACILITY & TERMINAL (Londonderry)[Part of 04-33CM]
E-34	6052	SALEM TO MANCHESTER	10418W	2007 2008 2009	PE PE PE	I-93	WATER QUALITY STUDY [Section 1702 - Designated Project; Demo Id NH054]
N/E	3888	SALEM TO MANCHESTER	10418Z	2007	CON	I-93	IMPLEMENTATION OF INCIDENT MANAGEMENT AND ITS TECHNOLOGIES FOR OVERALL CORRIDOR, TO IMPROVE EFFICIENCY BEFORE, DURING & AFTER I-93 CONSTRUCTION
N/E	2900	SALEM TO MANCHESTER	13933*	2007 2008 2009 2010	CON CON CON CON	I-93	RECONSTRUCT & WIDEN FROM S/L TO MANCHESTER [Garvee Bonded Projects - 2005 NH Legislature Approved]
N/E	3821	SALEM TO MANCHESTER	13933A	2010	CON	I-93	RECONSTRUCT & WIDEN MAINLINE FROM S/L TO EXIT 1 (Salem)
N/E	3815	SALEM TO MANCHESTER	13933B	2007	CON	I-93	REPLACE CROSS STREET BRIDGE - 089/052, AND EXIT 1 EMBANKMENT (Salem)
N/E	3814	SALEM TO MANCHESTER	13933C	2007	CON	I-93	EXIT 1: REPLACE RAMP BRIDGES & RECONSTRUCT RAMPS - 082/061, 083/061, 084/061 (Salem)
N/E	3818	SALEM TO MANCHESTER	13933D	2009	CON	I-93	RECONSTRUCT & WIDEN MAINLINE BETWEEN EXIT 1 & 2 AND REPLACE BRIDGES OVER NH 38 - 073/063, 077/063 (Salem)
N/E	3819	SALEM TO MANCHESTER	13933E	2009	CON	I-93	EXIT 2, REPLACE BRIDGES OVER PELHAM ROAD - 068/078 & 070/079 (Salem)
N/E	5728	SALEM TO MANCHESTER	13933F	2010	CON	I-93	EXIT 2 INTERCHANGE (Windham)
N/E	3816	SALEM TO MANCHESTER	13933G	2009	CON	I-93	MEDIAN WORK & REPLACE BROOKDALE ROAD BRIDGE - 058/089 (Salem)
N/E	3817	SALEM TO MANCHESTER	13933H	2007	CON	I-93	CONSTRUCT RELOCATED MAINLINE & NEW BRIDGES OVER NH 111A FROM BROOKDALE RD (approx) TO NH 111A (Salem-Windham)

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N/E	3820	SALEM TO MANCHESTER	13933I			I-93	EXIT 3 NH 111 BRIDGES AND NH 111 RELOCATION (Windham)
				2008	CON		
N/E	3822	SALEM TO MANCHESTER	13933J			I-93	EXIT 3 INTERCHANGE - 134/101 & 135/090 (Windham)
				2011	CON		
N/E	3824	SALEM TO MANCHESTER	13933K			I-93	RECONSTRUCT AND WIDEN MAINLINE NORTH OF EXIT 3 THROUGH WEIGH STATIONS - 096/163, 097/163, 099/160, 100/160 (Windham)
				2012	CON		
N/E	5729	SALEM TO MANCHESTER	13933L			I-93	RECONSTRUCT & WIDEN MAINLINE (Projects to be broken out)
				2009	CON		
				2012	CON		
				2013	CON		
				2014	CON		
				2015	CON		
				2016	CON		
N/E	4110	SALEM TO MANCHESTER	14800*			I-93	"DEBT SERVICE PROJECT" FOR: RECONSTRUCTION & WIDENING FROM S/L TO MANCHESTER [Garvee Bonded Projects - 2005 NH Legislature Approved]
				2008	CON		
				2009	CON		
				2010	CON		
N/E	3888	SALEM TO MANCHESTER TO CONCORD	10418Z			I-93	IMPLEMENTATION OF INCIDENT MANAGEMENT AND ITS TECHNOLOGIES FOR OVERALL CORRIDOR, TO IMPROVE EFFICIENCY BEFORE, DURING & AFTER I-93 CONSTRUCTION, INCLUDES CMAQ APP [06-22CM]
				2007	PE		
					CON		
N/E	3550	SEABROOK TO PORTSMOUTH	11151E			BLUE STAR TPK (I-95)	ITS DEPLOYMENT; ITS INITIATIVE ALLOWING FOR DEPLOYMENT OF CHANGEABLE MESSAGE BOARDS, HIGHWAY ADVISORY RADIO TO IMPROVE MOTORIST SAFETY AND AWARENESS [04-31CM]
				2007	PE		
					CON		
				2008	CON		
N/E	6227	SEACOAST	06-25CM				SEACOAST COMMUTER OPTIONS - PROGRAM EXPANSION / ACCELERATED IMPLEMENTATION [06-25CM]
				2007	CON		
				2008	CON		
				2009	CON		
E-28	5657	SOMERSWORTH	14419				RENOVATE THE HISTORIC B&M RAILROAD STATION 319 IN DOWNTOWN SOMERSWORTH CREATING A PUBLICLY ACCESSIBLE HISTORIC AREA & MULTI-MODAL TRANSPORTATION FOCAL POINT IN THE DOWNTOWN [04-59TE]
				2007	PE		
				2008	CON		
E-19	417	SOMERSWORTH, NH - BERWICK, ME	12228			NH 9	REHAB BRIDGE OVER SALMON FALLS RIVER - 101/114
				2008	PE		
					ROW		
				2010	CON		
E-24	2367	STATEWIDE				TRANSIT	CAPITAL EQUIPMENT FOR RURAL AREAS
				2007	UNK		
E-19	3570	STATEWIDE				ENG & ROW	MOVEABLE BRIDGE INSPECTION
				2007	PE		
				2010	PE		

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E-21	6290	STATEWIDE				TRANSIT	JOB ACCESS & REVERSE COMMUTE
				2007	UNK		
				2008	UNK		
				2009	UNK		
				2010	UNK		
E-21	6291	STATEWIDE				TRANSIT	NEW FREEDOMS INITIATIVE
				2007	UNK		
				2008	UNK		
				2009	UNK		
				2010	UNK		
ATT	6228	STATEWIDE	06-27CM				TRAFFIC SIGNAL OPTIMIZATION - NON-ATTAINMENT TOWNS ONLY [06-27CM]
				2007	PE		
				2008	PE		
				2009	CON		
E-38	1526	STATEWIDE	11848			ENG & ROW	STATEWIDE MONITORING OF ENVIRONMENTAL MITIGATION MEASURES
				2007	PE		
				2008	PE		
				2009	PE		
				2010	PE		
E-19	5739	STATEWIDE	14289			I-89 & I-93	REMEDIAL REPAIRS TO BRIDGES, JOINTS AND APPROACHES
				2008	CON		
DNA	5791	STATEWIDE	14333			ENG & ROW	TO PERFORM UNDERWATER INSPECTIONS ON BRIDGES THROUGHOUT NEW HAMPSHIRE
				2007	PE		
N/E	5614	STATEWIDE	14354			MISCELLANEOUS	EXPANSION OF THE ALTERNATIVE FUEL VEHICLE PROJECT (AFVP) TO PROVIDE INCREMENTAL COSTS OF AFVS AND 80% INFRASTRUCTURE COSTS [04-05CM]
				2007	CON		
E-34	6289	STATEWIDE	14744			VARIOUS	SCOUR & HYDRAULIC ANALYSIS ON 130 BRIDGES & WATERWAYS; FOUNDATION & HYDRAULIC ANALYSIS ON 48 BRIDGES WITH UNKNOWN FOUNDATIONS; DEVELOP SCOUR MANUAL & POA
				2007	PE		
					ROW		
				2008	PE		
					ROW		
DNA	6353	STATEWIDE	14780			VARIOUS	INSTALL DEBRIS NETTING UNDER BRIDGE DECKS
				2007	PE		
					ROW		
					CON		
DNA	6377	STATEWIDE	14802			VARIOUS	REPAIR OF DETERIORATED BRIDGE PILINGS ON ALL HIGHWAY SYSTEMS
				2007	PE		
					ROW		
					CON		
N/E	3833	STATEWIDE	BET-ISU			TRAFFIC	INTERSECTION / SIGNAL UPGRADES @ VARIOUS LOCATIONS (Bureau of Traffic)[Id 3833]
				2007	CON		

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E-6	7779	STATEWIDE	SRTS			VARIOUS	SAFE ROUTES TO SCHOOL PROGRAM
				2007	PE		
					ROW		
					CON		
				2008	PE		
					ROW		
					CON		
				2009	PE		
					ROW		
					CON		
				2010	PE		
					ROW		
					CON		
E-13	2681	STATEWIDE CONSULTANT				TRAFFIC	INSPECTION OF SIGN STRUCTURES ON ALL STATE MAINTAINED HIGHWAYS
				2010	PE		
E-34	3512	STATEWIDE-TRAC	13668			TRAINING	IMPLEMENT AND PARTICIPATE IN AASHTO TRAC PROGRAM IN LOCAL HIGH SCHOOLS TO ENCOURAGE STUDENTS TO EXPLORE OPPORTUNITIES IN TRANSPORTATION CAREERS (Annual Program)
				2007	PE		
				2008	PE		
				2009	PE		
				2010	PE		
E-19	3272	STODDARD - ANTRIM - HILLSBOROUGH				NH 9	CAPACITY, SAFETY IMPROVEMENTS, & ACQUIRE CONTROLLED ACCESS R.O.W. FROM JUST EAST OF NH 123 TO WESTERLY END OF HILLSBOROUGH BYPASS TO IMPROVE ROADWAY GEOMETRICS AND ALIGNMENT (APPROX. 10 MILES)
				2008	PE		
					ROW		
ATT	2765	STRATFORD				US 3	RECONSTRUCTION & WIDENING FROM JUST NORTH OF HOLLOW ROAD (END OF PROJECT #13005A) NORTHERLY 6.0 MILES TO APPROXIMATELY OLD US 3
				2008	PE		
				2009	ROW		
ATT	5658	STRATFORD	14420				RESTORATION AND RENOVATION OF HISTORIC STRATFORD GRAND TRUNK RR STATION [04-60TE]
				2007	PE		
					CON		
ATT	6151	SUTTON	14328B			I-89	INSTALLATION OF RWIS STATION AT THE SUTTON WELCOME CENTER
				2007	CON		
ATT	3256	SUTTON - NEW LONDON				I-89	RECLAIM AND 5-1/2" HBP FROM EXIT 10 TO EXIT 11 (4 MILES) [4R]
				2010	PE		
ATT	5659	SWANZEY	14421			ASHUELOT RAIL TRAIL	ASHUELOT RAIL TRAIL IMPROVEMENT - IMPROVE 13,000' OF RAIL TRAIL BY IMPROVING EXISTING RAIL ROAD BED TO A CRUSHED GRANITE HARD PACK SURFACE. INSTALL BIKE STORAGE FACILITY AT TOWN-OWNED TRAILHEAD PARKING AREA NEAR THE CRESSON COVERED BRIDGE [04-61TE]
				2007	PE		
				2008	CON		
ATT	6248	TAMWORTH	06-53TE			NH 113	CONSTRUCT 4' PAVED SHOULDERS ON BOTH SIDES STARTING 10' SOUTH OF THE SOUTHERLY ENTRANCE TO THE TAMWORTH ELEMENTARY SCHOOL AND GOING 1,212 LF TO THE NORTH END OF THE BRIDGE OVER THE BEARCAMP RIVER. [06-53TE]
				2008	PE		
					ROW		
				2010	CON		

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ATT	5718	TAMWORTH	14317				CHOCORUA VILLAGE INTERSECTION IMPROVEMENT PROJECT [Section 115 - Designated Project; Demo Id NH024] [Sister Project - Demo Id NH028]
				2007	CON		
ATT	6109	TAMWORTH	14317B				CHOCORUA VILLAGE INTERSECTION IMPROVEMENT PROJECT [Section 117 - Designated Project; Demo Id NH028] [Sister Project - Demo Id NH024]
				2007	CON		
ATT	5660	TAMWORTH	14422			NH 16 / NH 113	PROVIDE CROSSWALKS AT INTERSECTION OF NH 16 AND NH 113 WITH INROAD SIGNAGE, TRAFFIC CALMING ISLANDS, PAINTED SIDEWALKS AND SIGNAGE TO DIRECT PEDESTRIANS TO CROSSWALKS. PROVIDE PARKING FOR BICYCLES, MOTORCYCLES, CARS AND TRUCKS [04-62TE]
				2007	CON		
ATT	5661	TAMWORTH	14423			NH 113	PAVED SHOULDERS ON ROUTE 113 - CONSTRUCT 4' PAVED SHOULDERS ON BOTH SIDES OF NH113 STARTING IN TAMWORTH AT THE FOUR CORNERS TO PROJECT S-2487 (0.6 MILES), CONTINUING AT THE SOUTH END OF PROJECT S-2487 TO JUST SOUTH OF SOUTHEN ENTRANCE TO THE TAMWORTH ELEM
				2008	PE		
				2009	CON		
ATT	3270	TEMPLE				NH 101	REALIGNMENT OF 'S' CURVES EAST OF NH 45 (0.5 MILES)
				2010	PE		
ATT	6249	TILTON - NORTHFIELD	06-55TE				MODIFICATIONS TO THE WINNIPESAUKEE RIVER TRAIL PHASE 2: CONSTRUCT A STEEL ARCH BRIDGE OVER THE WINNIPESAUKEE RIVER SUITABLE FOR PEDESTRIANS AND BICYCLES WHICH IS ADA COMPLIANT. THE NEW BRIDGE WOULD BE BUILT UPSTREAM. [06-55TE]
				2008	PE		
				2009	ROW		
ATT	97	TROY	10434			NH 12	BYPASS OF TROY VILLAGE 6.0 Km (Pe & Row)
				2007	ROW		
				2008	ROW		
				2009	ROW		
ATT	6250	WAKEFIELD	06-57TE				SANBORNVILLE / PAUL SCHOOL SIDEWALK PROJECT: CONSTRUCT 3,740 LF OF 5' WIDE PEDESTRIAN / BICYCLE WAYS THAT LINK THE ELEMENTARY / MIDDLE SCHOOL WITH THE ADJACENT NEIGHBORHOODS AND TOWN CENTER. [06-57TE]
				2007	PE		
				2008	PE		
				2009	ROW		
				2010	CON		
ATT	1891	WALPOLE - CHARLESTOWN	14747			NH 12	RECONSTRUCTION FROM MAIN STREET IN WALPOLE TO NH 12A IN CHARLESTOWN, REMOVE CONCRETE BASE, ADD SHOULDERS AND IMPROVE DRAINAGE
				2007	PE		
					ROW		
				2008	PE		
					ROW		
				2009	PE		
					ROW		
ATT	1877	WALPOLE, NH - BELLOWS FALLS, VT	12905			BRIDGE STREET	VILAS BRIDGE REHABILITATION OVER CONNECTICUT RIVER - 062/052
				2007	PE		
				2008	PE		
				2009	PE		
					ROW		
ATT	3258	WARNER				I-89	1" OVERLAY FROM EXIT 8 TO EXIT 9 (4 MILES) [4R]
				2010	PE		

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ATT	3253	WARNER - SUTTON				I-89	RECLAIM AND 6-1/2" HBP FROM EXIT 9 TO EXIT 10 (7 MILES) [4R]
				2010	PE		
ATT	6218	WARNER - SUTTON	14511			I-89	4R TREATMENT FIRST 3 MI AND COLD PLANE AND INLAY REMAINING 13.6 MILE TRAVELED WAY PAVEMENT ONLY, BEGIN AT EXIT 7 AND PROCEED 17.6 MILES NORTH TO EXIT 11
				2007	PE		
				2008	CON		
ATT	2640	WARREN	13209			NH 25	RECONSTRUCTION FROM BENTON T/L TO 2 MILES SOUTH & ADD SHOULDERS
				2007	CON		
E-34	6155	WEIGHT LIMIT STUDY	14576			VARIOUS	ENGINEERING STUDY TO IDENTIFY / EVALUATE IMPACTS TO LOCAL & INTERSTATE HIGHWAYS (I-89 & 1-93) FROM INCREASING ALLOWABLE WEIGHT LIMIT FROM 80,000# TO 99,000#. (Federal Funds from NHDOS & NHDOT for this study)
				2007	PE		
ATT	5663	WHITEFIELD	14425			US 3	UPGRADE DRAINAGE & SIDEWALKS ON US 3 - UPGRADE 1200' OF SIDEWALKS, CURBING & SWALE. UPGRADE 1600' DRAINAGE PIPE & INSTALL 17 NEW CATCH BASINS [04-66TE]
				2007	PE		
				2008	CON		
ATT	651	WHITEFIELD	P2953			US 3	RECONSTRUCT FROM CARROLL T/L NORTH 2.1 MILES [Section 1602 - Designated Project; Demo Id NH012]
				2007	CON		
ATT	3745	WILTON	13906				REDESIGN & INSTALL NEW DOWNTOWN SIDEWALK SYSTEM INCLUDING: IMPROVEMENTS TO EXISTING SIDEWALKS; ADDITIONAL SIDEWALKS TO ELIMINATE USE OF PAINTED LINES ALONG STREET SURFACES; CLEARLY DEFINED CROSSWALKS; TRAFFIC CALMING DEVISES - PEDESTRIAN CONTROLLED TR
				2007	PE		
					CON		
N/E	2739	WILTON - MILFORD - AMHERST - BEDFORD	13692			NH 101	SAFETY IMPROVEMENTS @ VARIOUS LOCATIONS FROM WILTON TO WALLACE RD IN BEDFORD AS DETERMINED BY CORRIDOR STUDY
				2007	PE		
					ROW		
				2008	PE		
					ROW		
				2009	PE		
				2010	PE		
				2012	ROW		
				2013	CON		
				2016	CON		
ATT	2770	WINCHESTER				NH 10	RECONSTRUCT / REHABILITATE FROM MASS S/L TO NH 119 (MANNING HILL) 5.1 MILES
				2010	PE		
					ROW		
ATT	1873	WINCHESTER	12906			NH 10	BRIDGE REPLACEMENT OVER ASHUELOT RIVER - 152/181
				2007	PE		
					ROW		
				2009	ROW		
E-34	7777	WINDHAM				WALL STREET	ENGINEERING STUDY TO EXAMINE A CONNECTOR BETWEEN NH 111 AND NORTH LOWELL ROAD BY EXTENDING WALL STREET
				2007	PE		

CAA Code	Proj Id	Town	Project #	FY	Phase	Route/Road	ScopeOfWork
E-45	6251	WINDHAM	06-59TE				REHABILITATE WINDHAM DEPOT AS VISITORS CENTER / MUSEUM / WAY STATION ON SALEM - CONCORD BIKEWAY / RAIL TRAIL: ALSO MAKE IMPROVEMENTS TO PARKING AREAS. [06-59TE]
				2007	PE		
				2008	PE		
				2009	ROW		
				2010	CON		
E-33	2291	WINDHAM	13113			SOUTH LOWELL RD	PHASE 1 TO CONSTRUCT SHARED ROADWAY BICYCLE LANE - 2.1 MILES [98-03TE]
				2007	PE		
					ROW		
				2008	CON		
N/E	34	WINDHAM - SALEM	10075			NH 111 BYPASS	CONSTRUCT BYPASS AROUND SHADOW LAKE. NH 28 FROM LAKE STREET TO JONES ROAD [Pe & Row Only]
				2011	PE		
					ROW		
N/E	35	WINDHAM - SALEM	10075A			NH 111	RECONSTRUCTION & SIGNALIZATION @ NORTH POLICY ROAD
				2013	PE		
				2014	ROW		
				2016	CON		
N/E	3171	WINDHAM - SALEM	10075F			NH 28 / NH 111	RECONSTRUCTION OF INTERSECTION @ LAKE STREET AND SHADOW LAKE ROAD
				2013	CON		
E-42	6041	WINDHAM - SALEM	10075K			NH 111	LANDSCAPING
				2008	CON		
ATT	1889	WOLFEBORO	13954			NH 28	IMPROVE ROADWAY, INTERSECTIONS, AND DRAINAGE FROM THE ALTON T/L TO WOLFEBORO FALLS
				2007	PE		
					ROW		
				2010	ROW		
ATT	2742	WOODSTOCK				US 3	SAFETY AND PAVEMENT IMPROVEMENTS TO UPGRADE US 3
				2009	PE		
				2010	PE		
					ROW		
ATT	6345	WOODSTOCK	14773			I-93	NB NON MEDIAN SIDE & SB MEDIAN SIDE ROCK CUT 004R MAINTAIN & REPLACE EXIST MECHANICAL ROCK STABILIZATION MEASURES
				2007	PE		
				2009	CON		

Exhibit 5.
Approved 2006 round of CMAQ/TE projects

Ten Year Transportation Improvement Program 2007-2016

Approved 2006 Round CMAQ Projects

05-Oct-2006

Project Name/#	Route/Road:	Location; Scope of Work				$(M)	Comments:
CONCORD 06-02CM	STORRS STREET	PARK AND RIDE					Approved 2006 Application!
			C	2011	L400 - CONGESTION MITIGATION & AIR QUALITY IMPRO	.900	
					Subtotal:	.900	
			P	2009	L400 - CONGESTION MITIGATION & AIR QUALITY IMPRO	.150	
					Subtotal:	.150	
			R	2010	L400 - CONGESTION MITIGATION & AIR QUALITY IMPRO	1.300	
					Subtotal:	1.300	
					Total:	2.350	
DOVER - PORTSMOUTH - BOSTON 06-05CM		INCREASED TRANSIT SERVICE AND INTERCITY BUS MARKETING CAMPAIGN FOR NH 16 / I-95 CORRIDORS [06-05CM & 06-23CM]					Approved 2006 Application!
			C	2007	L400 - CONGESTION MITIGATION & AIR QUALITY IMPRO	1.470	
					Subtotal:	1.470	
			P	2007	L400 - CONGESTION MITIGATION & AIR QUALITY IMPRO	.300	
					Subtotal:	.300	
					Total:	1.770	
DURHAM 13867	MAIN STREET	RECONSTRUCT MAIN ST TO PERMIT BI-DIRECTION TRANSIT SHUTTLE SERVICE / PROJECT INCLUDES BIKE/PED SAFETY IMPROVEMENTS FROM WESTERN EDGE OF CAMPUS TO DOWNTOWN @ PETTEE BROOK LANE [02-07CM] & LIGHTING [06-29CM]					Combined with 06-29CM (Lighting). Selection Amount includes both 2002 & 2006 Apps and approved by CMAQ Advisory Committee 3-17-06.
			C	2007	L400 - CONGESTION MITIGATION & AIR QUALITY IMPRO	.304	
			C	2007	L400 - CONGESTION MITIGATION & AIR QUALITY IMPRO	1.490	
					Subtotal:	1.794	
					Total:	1.794	

Phase: C = Construction P = Preliminary Engineering R = Right of Way

Project Name/#	Route/Road:	Location; Scope of Work				$(M)	Comments:
GREENLAND 06-08CM		TRUCKSTOP ELECTRIFICATION					Approved 2006 Application!
			C	2010	L400 - CONGESTION MITIGATION & AIR QUALITY IMPRO	.828	
					Subtotal:	.828	
			P	2007	L400 - CONGESTION MITIGATION & AIR QUALITY IMPRO	.006	
					Subtotal:	.006	
			R	2008	L400 - CONGESTION MITIGATION & AIR QUALITY IMPRO	.001	
					Subtotal:	.001	
					Total:	.835	
HUDSON 06-10CM		TRAFFIC SIGNAL COORDINATION SYSTEM PHASE II [06-10CM]					Approved 2006 Application!
			C	2010	L400 - CONGESTION MITIGATION & AIR QUALITY IMPRO	.100	
					Subtotal:	.100	
			P	2007	L400 - CONGESTION MITIGATION & AIR QUALITY IMPRO	.049	
					Subtotal:	.049	
			R	2008	L400 - CONGESTION MITIGATION & AIR QUALITY IMPRO	.001	
					Subtotal:	.001	
					Total:	.150	
MANCHESTER 06-12CM		INCREASED TRANSIT SERVICE [06-12CM]					Approved 2006 Application!
			C	2009	L400 - CONGESTION MITIGATION & AIR QUALITY IMPRO	1.445	
					Subtotal:	1.445	
					Total:	1.445	
NASHUA 06-13CM		INCREASED TRANSIT SERVICE [06-13CM]					Approved 2006 Application!
			C	2009	L400 - CONGESTION MITIGATION & AIR QUALITY IMPRO	.913	
					Subtotal:	.913	
					Total:	.913	

Project Name/#	Route/Road:	Location; Scope of Work	Phase	Year	Program	$(M)	Comments:
SALEM TO MANCHESTER TO CONCORD 10418Z	I-93	IMPLEMENTATION OF INCIDENT MANAGEMENT AND ITS TECHNOLOGIES FOR OVERALL CORRIDOR, TO IMPROVE EFFICIENCY BEFORE, DURING & AFTER I-93 CONSTRUCTION, INCLUDES CMAQ APP [06-22CM]					CMAQ App [06-22CM] is a subset of this project. Includes $2,339,843 of additional funds in addition to CMAQ funding.
			C	2007	L010 - INTERSTATE MAINTENANCE	.400	
			C	2007	L010 - INTERSTATE MAINTENANCE	.800	
			C	2007	L400 - CONGESTION MITIGATION & AIR QUALITY IMPRO	2.700	
					Subtotal:	3.900	
					Total:	3.900	
SEACOAST 06-25CM		SEACOAST COMMUTER OPTIONS - PROGRAM EXPANSION / ACCELERATED IMPLEMENTATION [06-25CM]					Approved 2006 Application!
			C	2007	L400 - CONGESTION MITIGATION & AIR QUALITY IMPRO	.100	
			C	2008	L400 - CONGESTION MITIGATION & AIR QUALITY IMPRO	.100	
			C	2009	L400 - CONGESTION MITIGATION & AIR QUALITY IMPRO	.100	
					Subtotal:	.300	
					Total:	.300	
STATEWIDE 06-27CM		TRAFFIC SIGNAL OPTIMIZATION - NON-ATTAINMENT TOWNS ONLY [06-27CM]					Approved 2006 Application!
			C	2009	L400 - CONGESTION MITIGATION & AIR QUALITY IMPRO	.100	
					Subtotal:	.100	
			P	2007	L400 - CONGESTION MITIGATION & AIR QUALITY IMPRO	.100	
			P	2008	L400 - CONGESTION MITIGATION & AIR QUALITY IMPRO	.100	
					Subtotal:	.200	
					Total:	.300	

Exhibit 6.
Not Exempt Project List from Ten-Year Plan & Long Range Plans

Not Exempt Project List

ProjId	Proj#	Town	Description	MPO	1st Const FY
1818	13953	BEDFORD	NH 101, WIDEN TO 5 LANES FOR APPROXIMATELY 2 MILES, FROM NH 114 TO WALLACE ROAD	Manchester	2014
2844	11512A	BEDFORD - MANCHESTER - LONDONDERRY	AIRPORT ACCESS ROAD, CONSTRUCT BRIDGE OVER MERRIMACK RIVER, NH 3A, AND BRIDGE BOX CULVERT UNDER NH 3A FOR WILDLIFE CROSSING	Manchester	2007
5669	11512C	BEDFORD - MANCHESTER - LONDONDERRY	AIRPORT ACCESS ROAD, CONSTRUCT FE EVERETT TPK BRIDGE OVER MANCHESTER AIPORT ACCESS ROAD (MAAR) AND RAMP A & C BRIDGES	Manchester	2007
3794	11512F	BEDFORD - MANCHESTER - LONDONDERRY - MERRIMACK	AIRPORT ACCESS ROAD, CONSTRUCT US 3, RAMPS H AND J, AND AIRPORT ACCESS ROAD BRIDGE OVER US 3	Manchester / Nashua	2009
5670	11512H	BEDFORD - MANCHESTER - LONDONDERRY - MERRIMACK	AIRPORT ACCESS ROAD, CONSTRUCT NORTH OF LITTLE COHAS BRIDGE AND FINAL PAVING TO NH 3A	Manchester / Nashua	2009
5671	11512I	BEDFORD - MANCHESTER - LONDONDERRY - MERRIMACK	AIRPORT ACCESS ROAD, WIDEN FE EVERETT TURNPIKE	Manchester / Nashua	2009
3150	11512D	BEDFORD - MANCHESTER - LONDONDERRY- MERRIMACK	AIRPORT ACCESS ROAD, CONSTRUCT ACCESS ROAD OVER LITTLE COHAS RIVER AND ACCESS ROAD TO THE MERRIMACK RIVER BRIDGE	Manchester / Nashua	2008
2075	13742	BOW - CONCORD	I-93, WIDEN FROM I-89 TO BETWEEN EXITS 15 AND 16 TO MATCH INTO EXISTING CONCORD PROJECT 11449 @ EXIT 16; 163/106, 136/160, 135/160, 203/087, 142/116		2014
3701	13860	CONCORD	LOUDON RD / PEMBROKE RD / OLD TPK RD, CONSTRUCT COMBINATION OF SIDEWALKS & BIKE PATHS ALONG WITH CURBING, DRAINAGE [02-03CM]		2007
5615	14426	CONCORD	CENTRE, LIBERTY, & AUBURN ST, CONSTRUCT ROUNDABOUT AT INTERSECTION OF CENTRE, LIBERTY, & AUBURN ST. [04-10CM]		2007
1816	13065	DERRY / LONDONDERRY	I-93, CONSTRUCTION OF EXIT 4A - NEW INTERCHANGE BETWEEN EXISTING EXIT 4 AND EXIT 5 TO: (1) RELIEVE TRAFFIC; (2) ALLOW ACCESS TO POTENTIAL DEVELOPMENT OF INDUSTRIAL LAND	Manchester	2011
5622	14287	DOVER	INDIAN BROOK DRIVE, CONSTRUCT PARK'N' RIDE FACILITY (Approx 416 spaces) INCLUDING A TERMINAL BUILDING IN THE VICINITY OF EXIT 9 OF THE SPAULDING TURNPIKE [04-32CM]	Seacoast	2007
6221	06-05CM	DOVER - PORTSMOUTH - BOSTON	INCREASED TRANSIT SERVICE AND INTERCITY BUS MARKETING CAMPAIGN FOR NH 16 / I-95 CORRIDORS [06-05CM & 06-23CM]	Seacoast	2007
3288		DOVER - ROCHESTER - SOMERSWORTH	NH 108, WIDENING AND RECONST. FROM THE WEEKS CORNER INT. NORTH 4.8 MILES TO THE NH 108 INT. WITH GRANITE PARKWAY IN ROCHESTER AND WIDENING OF SIXTH ST. CONNECTOR BRIDGE OVER THE SPAULDING TPK AT EXIT 9 WITH NB OFF-RAMP RECONST.	Seacoast	2016
2083	11429B	DOVER - ROCHESTER - SOMERSWORTH	SPAULDING TPK, CONSTRUCTION OF EXIT 10 AND EASTERLY CONNECTION - Phase 1	Seacoast	2014
3555	11429C	DOVER - ROCHESTER - SOMERSWORTH	SPAULDING TURNPIKE, CONSTRUCTION OF EXIT 10 AND EASTERLY CONNECTION - Phase 2	Seacoast	2015
188	11429D	DOVER - ROCHESTER - SOMERSWORTH	SPAULDING TPK, CONSTRUCTION OF EXIT 10 AND EASTERLY CONNECTION - Phase 3	Seacoast	2016
3710	13868	DURHAM	EXPAND OR REPLACE ACCESSIBLE RAIL PLATFORM, STATION RENOVATION TO INCLUDE DEDICATED INDOOR TRAVELER WAITING SPACE AND CONSTRUCTION TO PROVIDE INTERMODAL BUS ACCESS TO PLATFORM AREA [02-08CM]	Seacoast	2007
3711	13869	DURHAM	PURCHASE THREE 14 PASSENGER TRANSIT VEHICLE FOR EXPANSION OF UNH WILDCAT SHUTTLE SYSTEM BEYOND CORE CAMPUS AREAS [02-09CM]	Seacoast	2007
3713	13871	EXETER	LINCOLN STREET, EXPAND EXISTING PASSENGER RAILROAD STATION PARKING AREA (PROJECT #10025A) FROM 78 TO 140 PARKING SPACES [02-13CM]	Seacoast	2007
6222	06-08CM	GREENLAND	TRUCKSTOP ELECTRIFICATION [06-08CM]	Seacoast	2010
5683	14320	HOOKSETT	CONNECTOR ROAD, BUILD A CONNECTOR ROAD BETWEEN US 3 / NH 28 AND MERRIMACK STREET INCLUDING INTERSECTION IMPROVEMENTS	Manchester	2007
4107	12537A	HOOKSETT	US 3 / NH 28, WIDEN NORTH OF BENTON ROAD SOUTH 0.411 MILES TO THE INTERSECTION WITH MARTIN'S FERRY ROAD [Section 117 - Designated Project; Demo Id NH031]	Manchester	2007
6223	06-10CM	HUDSON	TRAFFIC SIGNAL COORDINATION SYSTEM PHASE II [06-10CM]	Nashua	2010
2086	10625O	HUDSON	CIRCUMFERENTIAL HWY, CONSTRUCTION OF MITIGATION SITE AT BENSON'S - PHASE 1	Nashua	2016
2087	10625Q	HUDSON	CIRCUMFERENTIAL HWY, CONSTRUCT BRIDGES (5), OLD DERRY ROAD, BARRETT'S HILL ROAD, GLOVER BROOK - PHASE 3	Nashua	2016
2088	10625R	HUDSON	CIRCUMFERENTIAL HWY, CONSTRUCT MAINLINE & RAMPS, NH 102 TO NH 111, & ROADWAY @ NH 111 - PHASE 3	Nashua	2016

Not Exempt Project List

3161	10625S	HUDSON	CIRCUMFERENTIAL HWY, CLEAN UP AND CLOSURE OF MITIGATION SITE AT BENSON'S	Nashua	2008
1828	10309B	KEENE - SWANZEY	NH 10/101 (WINCHESTER ST), RECONSTRUCTION FROM MATHEWS ROAD NORTH TO PEARL STREET. / ISLAND STREET INCLUDING INTERSECTION AT KEY ROAD		2013
1829	10309C	KEENE - SWANZEY	NH 12, NEW CONSTRUCTION FROM NH 32 NORTHERLY TO NH 101/OPTICAL AVENUE INTERSECTION - APPROX. 0.5 MILES		2015
2066	10309D	KEENE - SWANZEY	NH 10/12/101, CONSTRUCT INTERCHANGE AND EAST BOUND & WEST BOUND RAMPS @ WINCHESTER STREET INTERSECTION		2014
2067	10309E	KEENE - SWANZEY	NH 101, RECONSTRUCT INTERSECTION @ NH 12 (MAIN STREET)		2016
2068	10309F	KEENE - SWANZEY	NH 9/10/12/101, RECONSTRUCTION "SPDI" MAINLINE & TRUMPHET INTERCHANGE		2016
2280	10309G	KEENE - SWANZEY	NH 9/10/12, RECONSTRUCT INTERCHANGE @ WEST STREET		2014
5705	10309J	KEENE - SWANZEY	NH 9 / NH 101, INTERIM INTERSECTION IMPROVEMENTS @ 'T' INTERSECTION & CONSTRUCTION OF MULTI-USE TRAIL OVER NH 12/101		2009
5706	10309K	KEENE - SWANZEY	NH 12/101, INTERIM INTERSECTION IMPROVEMENTS @ MAIN STREET		2010
5707	10309L	KEENE - SWANZEY	NH 12 / 101, CONSTRUCTION OF INTERIM WIDENING WITH REPLACEMENT OF THE ASHUELOT RIVER BRIDGE		2010
2740		LITCHFIELD	ALBUQUERQUE AVE, CONSTRUCT .3 MILE SEGMENT FROM APRIL DRIVE TO NH 3A, INCLUDING INTERSECTION IMPROVEMENTS @ NH 3A	Nashua	2011
125	10625T	LITCHFIELD	NH 3A (Circumferential Hwy), CONSTRUCT INDUSTRIAL DRIVE, OFF NH 3A	Nashua	2014
2089	10625K	LITCHFIELD - HUDSON	CIRCUMFERENTIAL HWY, CONSTRUCT MAINLINE, RAMPS, TOLL BOOTH, NH 3A IMPROVEMENTS, BOAT RAMP ACCESS ROAD - PHASE 1	Nashua	2014
2091	10625P	LITCHFIELD - HUDSON	CIRCUMFERENTIAL HWY, CONSTRUCT MAINLINE & RAMPS FROM NH 3A TO NH 102 - PHASE 2	Nashua	2014
2090	10625H	LITCHFIELD - NASHUA	CIRCUMFERENTIAL HWY, CONSTRUCT NORTHERN RIVER CROSSING OVER MERRIMACK RIVER (2 BRIDGES) - PHASE 1	Nashua	2014
3703	13872	LONDONDERRY	VARIOUS, CONSTRUCT APPROX. 6200' OF MULTIPURPOSE PATH & SIDEWALK: BEGINNING @ PILLSBURY & WILSHIRE RDS TO MAMMOTH RD & CONTINUE AS AN INDEPENDENT MULTI-USE PATH [02-16CM]	Manchester	2007
3275		LONDONDERRY	NH 28 & NH 128, INTERSECTION IMPROVEMENTS, FOR SAFETY AND TRAFFIC FLOW	Manchester	2015
2968	13512	MANCHESTER	CONSTRUCT 600 SPACE PARK'N RIDE STRUCTURE [00-13CM]	Manchester	2016
2745		MANCHESTER	FEE TPK, RECONSTRUCT INTERCHANGE AT EXIT 7 TO BECOME FULL INTERCHANGE	Manchester	2016
6224	06-12CM	MANCHESTER	INCREASED TRANSIT SERVICE [06-12CM]	Manchester	2009
425	12259	MERRIMACK	US 3, PARK'N'RIDE, 250 SPACES - INTERMODAL FACILITY NEAR RR FACILITY, FEE Tpk, AND US 3 [94-40CM]	Nashua	2014
3279		MERRIMACK	US 3, CAPACITY IMPROVEMENTS TO IMPROVE TRAFFIC FLOW AT A NUMBER OF INTERSECTIONS AS IDENTIFIED IN RECENT STUDIES COMPLETED BY THE TOWN OF MERRIMACK	Nashua	2015
2096	10625N	MERRIMACK	CIRCUMFERENTIAL HWY, CONSTRUCT MAINLINE, US 3 TO EXIT 9 & BRIDGES (2)	Nashua	2016
3662	13761	MERRIMACK - BEDFORD	F.E.E.Tpk, WIDEN TURNPIKE TO A 3 LANE TYPICAL FROM EXIT 11 IN MERRIMACK TO THE BEDFORD TOLL PLAZA TO MEET CURRENT AND PROJECTED VOLUME	Manchester / Nashua	2015
2099	10625I	MERRIMACK - NASHUA	CIRCUMFERENTIAL HWY, CONSTRUCT BRIDGES (4), MAINLINE & RAMPS OVER PENNICHUCK BROOK - PHASE 1	Nashua	2014
2100	10625M	MERRIMACK - NASHUA	CIRCUMFERENTIAL HWY, CONSTRUCT FOR NHCH & FEE TPK: MAINLINE, RAMPS, & BRIDGES (5) @ EXIT 9 INTERCHANGE - PHASE 1	Nashua	2016
2344	13117	NASHUA	FEE TPK, CONSTRUCT 1000 SPACE PARK'N'RIDE NEAR B&M RR WITH RAIL PLATFORM; FACILITY WILL BE USED FOR CAR POOL, VANPOOL, & PASSENGER RAIL MODES [98-13CM]	Nashua	2007
2959	13514	NASHUA	PURCHASE COMMUTER RAIL EQUIPMENT [00-12CM]	Nashua	2008
5621	14432	NASHUA	VARIOUS, TRAFFIC SIGNALS, EXPAND THE CLOSED LOOP SYSTEM TO INCLUDE THIRTY ADDITIONAL INTERSECTIONS [04-30CM]	Nashua	2010
3536		NASHUA	EAST HOLLIS STREET, RECONSTRUCTION OF EAST HOLLIS STREET FROM MAIN STREET TO HUDSON TOWN LINE TO IMPROVE CAPACITY	Nashua	2013
6225	06-13CM	NASHUA	INCREASED TRANSIT SERVICE [06-13CM]	Nashua	2009

2641	10040G	NASHUA	BALDWIN STREET, RECONSTRUCTION AND EXTENSION FROM AMHERST STREET, OVER B&M RAILROAD AND THE FUTURE BROAD STREET PARKWAY TO FAIRMOUNT STREET, WITH CONNECTOR TO FUTURE PARKWAY [Section 1602 - Designated Project; Demo Id NH003] [Sister Demo Projects: 10040A,	Nashua	2010
2642	10040H	NASHUA	BROAD STREET PARKWAY, CONSTRUCTION FROM NASHUA RIVER WESTERLY TO BROAD STREET (TO SUBGRADE ONLY) [Section 1602 - Designated Project; Demo Id NH003] [Sister Demo Projects: 10040A, G, H, J, S, T]	Nashua	2009
2643	10040I	NASHUA	BROAD STREET PARKWAY, CONSTRUCTION OF BRIDGE OVER NASHUA RIVER; FAIRMOUNT STREET BRIDGE OVER PARKWAY	Nashua	2012
2647	10040J	NASHUA	BROAD STREET PARKWAY, CONSTRUCTION FROM WEST HOLLIS STREET TO PINE STREET EXTENSION INCLUDING BRIDGE OVER CANAL [Section 1602 - Designated Project; Demo Id NH003] [Sister Demo Projects: 10040A, G, H, J, S, T]	Nashua	2010
2648	10040K	NASHUA	BROAD STREET PARKWAY, BASE COURSES, WEARING COURSES, SIGNING, MARKINGS, RR CROSSING, AND SIGNALS	Nashua	2012
2649	10040L	NASHUA	BROAD STREET PARKWAY, PROJECT WIDE LANDSCAPING	Nashua	2013
3593	10136A	NASHUA	NH 101A, WIDENING BETWEEN CELINA AVENUE INTERSECTION TO AMHERST STREET MALL INTERSECTION (1.5 MILES) TO EXPAND FROM EXISTING FIVE LANES TO SEVEN LANES AS RECOMMENDED BY CORRIDOR STUDY (Milford to Nashua 10136)	Nashua	2010
2082	10625L	NASHUA - MERRIMACK	CIRCUMFERENTIAL HWY, CONSTRUCT MAINLINE, RAMPS, US 3 ROADWAY IMPROVEMENTS & BRIDGES (2) - PHASE 1	Nashua	2016
3162	10625U	NASHUA - MERRIMACK	F.E.E.Tpk, WIDENING TO CIRCUMFERENTIAL HWY NORTH	Nashua	2014
1191	11238	NEWINGTON - DOVER	NH 16 / US 4 / SPLDG TPK, WIDEN TURNPIKE INCLUDING LITTLE BAY BRIDGES FROM GOSLING ROAD TO DOVER TOLL [Section 117 - Designated Project; Demo Id NH036] [Sister Demo Id NH053 & NH070]	Seacoast	2010
6138	11238K	NEWINGTON - DOVER	NH 16 / US 4 / SPAULDING TURNPIKE, RECONFIGURATION AND RELOCATION OF RAMPS AND ACCESS (To provide matching funds only to the federally-funded portion of the 11238 project for PE, ROW & Construction)	Seacoast	2009
3708	13878	NEWMARKET - NEWFIELDS	NH 108, CONSTRUCT 4' BIKE SHOULDERS FROM THE SOUTHERLY LIMIT OF PROJECT 13107 IN NEWMARKET TO THE NORTHERLY LIMIT OF PROJECT P4386 IN NEWFIELDS [02-25CM]	Seacoast	2007
1814	13596	NORTHFIELD	I-93, COMPLETE EXIT 19		2014
3897	10044D	PLAISTOW	NH 125, RECONSTRUCT INTERSECTION OF OLD COUNTY ROAD	Sal-Pla-Win	2007
6372	10044F	PLAISTOW	NH 125, RECONSTRUCT INTERSECTIONS& CONSTRUCT JUG HANDLES	Sal-Pla-Win	2010
24	10044B	PLAISTOW - KINGSTON	NH 125, RECONSTRUCTION FROM EAST ROAD IN PLAISTOW NORTHERLY APPROX. 6.0 +/- MILE TO NH 125 & MAIN STREET INTERSECTION IN KINGSTON	Sal-Pla-Win	2010
3898	10044E	PLAISTOW - KINGSTON	NH 125, RECONSTRUCT INTERSECTION OF ROADSTONE DRIVE AND CONSTRUCT EXTENSION OF KINGSTON ROAD	Sal-Pla-Win	2008
2965	13515	PLAISTOW, NH to HAVERHILL, MA	CONSTRUCT RAIL PLATFORM & PROVIDE THREE YEARS OF OPERATING SUBSIDY FOR PASSENGER RAIL [00-20CM]	Sal-Pla-Win	2009
5617	14428	PORTSMOUTH	MARKET STREET EXTENSION, BIKE / PED PATH, BETWEEN MICHAEL SUCCI DRIVE AND THE NH PORT AUTHORITY [04-16CM]	Seacoast	2007
2101	10620G	ROCHESTER	SPAULDING TPK, CONSTRUCTION OF EXIT 11 & 12 (NH 125) BRIDGE - 158/110, AND 2nd BARREL - PHASE 1	Seacoast	2007
2103	10620H	ROCHESTER	SPAULDING TPK, CONSTRUCTION OF 2nd BARREL THROUGH EXIT 13 - PHASE 2 - 139/094	Seacoast	2008
2104	10620I	ROCHESTER	SPAULDING TPK, CONSTRUCTION OF 2nd BARREL THROUGH EXIT 14 AND EXIT 15 - PHASE 3	Seacoast	2009
2105	10620J	ROCHESTER	SPAULDING TPK, CONSTRUCTION OF 2nd BARREL THROUGH EXIT 16 (Chestnut Hill Connector) - PHASE 4	Seacoast	2012
3885	10620K	ROCHESTER	SPAULDING TPK, EXIT 11 & 12 (NH 125) BRIDGE - 157/110, AND 2ND BARREL - PHASE 2	Seacoast	2008
3973	10620L	ROCHESTER	SPAULDING TPK, CONSTRUCTION OF 2ND BARREL THROUGH EXIT 14 & 15 - PHASE 3, PART B	Seacoast	2011

Not Exempt Project List

1800	10418F	SALEM TO MANCHESTER	I-93, CONSTRUCTION OF WETLAND MITIGATION SITES IN ANTICIPATION OF WETLAND IMPACTS ASSOCIATED WITH FUTURE IMPROVEMENTS TO I-93 FROM SALEM TO MANCHESTER. INCLUDES: LONDONDERRY L-8, L-8 EXTENSION, L-12 SITES; & LONDONDERRY ADVANCE MITIGATION / WETLAND CREA	Manchester / Sal-Pla-Win	2012
3137	10418G	SALEM TO MANCHESTER	I-93, PARK & RIDE @ EXIT 2 (Salem) [Part of 04-33CM]	Sal-Pla-Win	2007
3138	10418H	SALEM TO MANCHESTER	I-93, PARK & RIDE @ EXIT 3 (Windham) [Part of 04-33CM]	Sal-Pla-Win	2010
5613	10418L	SALEM TO MANCHESTER	I-93, IMPLEMENT EXPANDED BUS SERVICE & NEW COMMUTER INCENTIVE PROGRAM. PURCHASE 14 COMMUTER COACHES & PROVIDE 3 YEARS OF OPERATING SUPPORT [04-04CM]	Manchester / Sal-Pla-Win	2007
3888	10418Z	SALEM TO MANCHESTER	I-93, IMPLEMENTATION OF INCIDENT MANAGEMENT AND ITS TECHNOLOGIES FOR OVERALL CORRIDOR, TO IMPROVE EFFICIENCY BEFORE, DURING & AFTER I-93 CONSTRUCTION	Manchester / Sal-Pla-Win	2007
2900	13933*	SALEM TO MANCHESTER	I-93, RECONSTRUCT & WIDEN FROM S/L TO MANCHESTER [Garvee Bonded Projects - 2005 NH Legislature Approved]	Manchester / Sal-Pla-Win	2007
3821	13933A	SALEM TO MANCHESTER	I-93, RECONSTRUCT & WIDEN MAINLINE FROM S/L TO EXIT 1 (Salem)	Sal-Pla-Win	2010
3815	13933B	SALEM TO MANCHESTER	I-93, REPLACE CROSS STREET BRIDGE - 089/052, AND EXIT 1 EMBANKMENT (Salem)	Sal-Pla-Win	2007
3814	13933C	SALEM TO MANCHESTER	I-93, EXIT 1: REPLACE RAMP BRIDGES & RECONSTRUCT RAMPS - 082/061, 083/061, 084/061 (Salem)	Sal-Pla-Win	2007
3818	13933D	SALEM TO MANCHESTER	I-93, RECONSTRUCT & WIDEN MAINLINE BETWEEN EXIT 1 & 2 AND REPLACE BRIDGES OVER NH 38 - 073/063, 077/063 (Salem)	Sal-Pla-Win	2009
3819	13933E	SALEM TO MANCHESTER	I-93, EXIT 2, REPLACE BRIDGES OVER PELHAM ROAD - 068/078 & 070/079 (Salem)	Sal-Pla-Win	2009
5728	13933F	SALEM TO MANCHESTER	I-93, EXIT 2 INTERCHANGE (Windham)	Sal-Pla-Win	2010
3816	13933G	SALEM TO MANCHESTER	I-93, MEDIAN WORK & REPLACE BROOKDALE ROAD BRIDGE - 058/089 (Salem)	Sal-Pla-Win	2009
3817	13933H	SALEM TO MANCHESTER	I-93, CONSTRUCT RELOCATED MAINLINE & NEW BRIDGES OVER NH 111A FROM BROOKDALE RD (approx) TO NH 111A (Salem-Windham)	Sal-Pla-Win	2007
3820	13933I	SALEM TO MANCHESTER	I-93, EXIT 3 NH 111 BRIDGES AND NH 111 RELOCATION (Windham)	Sal-Pla-Win	2008
3822	13933J	SALEM TO MANCHESTER	I-93, EXIT 3 INTERCHANGE - 134/101 & 135/090 (Windham)	Sal-Pla-Win	2011
3824	13933K	SALEM TO MANCHESTER	I-93, RECONSTRUCT AND WIDEN MAINLINE NORTH OF EXIT 3 THROUGH WEIGH STATIONS - 096/163, 097/163, 099/160, 100/160 (Windham)	Sal-Pla-Win	2012
5729	13933L	SALEM TO MANCHESTER	I-93, RECONSTRUCT & WIDEN MAINLINE (Projects to be broken out) [Section 1702 - Designated Project; Demo Id NH048] [Sister Demo Id NH066 & NH074]	Manchester / Sal-Pla-Win	2009
4110	14800*	SALEM TO MANCHESTER	I-93, "DEBT SERVICE PROJECT" FOR: RECONSTRUCTION & WIDENING FROM S/L TO MANCHESTER [Garvee Bonded Projects - 2005 NH Legislature Approved]	Manchester / Sal-Pla-Win	2008
3888	10418Z	SALEM TO MANCHESTER TO CONCORD	I-93, IMPLEMENTATION OF INCIDENT MANAGEMENT AND ITS TECHNOLOGIES FOR OVERALL CORRIDOR, TO IMPROVE EFFICIENCY BEFORE, DURING & AFTER I-93 CONSTRUCTION, INCLUDES CMAQ APP [06-22CM]	Manchester / Sal-Pla-Win	2007
3550	11151E	SEABROOK TO PORTSMOUTH	BLUE STAR TPK (I-95), ITS DEPLOYMENT; ITS INITIATIVE ALLOWING FOR DEPLOYMENT OF CHANGEABLE MESSAGE BOARDS, HIGHWAY ADVISORY RADIO TO IMPROVE MOTORIST SAFETY AND AWARENESS [04-31CM]	Seacoast	2007
6227	06-25CM	SEACOAST	SEACOAST COMMUTER OPTIONS - PROGRAM EXPANSION / ACCELERATED IMPLEMENTATION [06-25CM]	Seacoast	2007
5623	14265	STATEWIDE	CREATION OF A TRANSPORTATION MANAGEMENT CENTER (WITH EMERGENCY OPERATIONS CENTER, EMERGENCY COMMUNICATION CENTER, & STATE POLICE DISPATCH) [04-34CM]	All	2007
5614	14354	STATEWIDE	MISCELLANEOUS, EXPANSION OF THE ALTERNATIVE FUEL VEHICLE PROJECT (AFVP) TO PROVIDE INCREMENTAL COSTS OF AFVS AND 80% INFRASTRUCTURE COSTS [04-05CM]	All	2007
3833	BET-ISU	STATEWIDE	TRAFFIC, INTERSECTION / SIGNAL UPGRADES @ VARIOUS LOCATIONS (Bureau of Traffic)[Id 3833]	All	2007
3142	10434A	TROY	NH 12 BYPASS, CONSTRUCTION OF BYPASS FROM MONADNOCK STREET NORTHERLY		2012
3143	10434B	TROY	NH 12 BYPASS, CONSTRUCTION OF BYPASS FROM MONADNOCK STREET SOUTHERLY		2015
4137		WHITEFIELD	MT. WASHINGTON AIRPORT, SNOW REMOVAL EQUIPMENT STORAGE BUILDING		2009
35	10075A	WINDHAM - SALEM	NH 111, RECONSTRUCTION & SIGNALIZATION @ NORTH POLICY ROAD	Sal-Pla-Win	2016

Not Exempt Project List

3171	10075F	WINDHAM - SALEM	NH 28 / NH 111, RECONSTRUCTION OF INTERSECTION @ LAKE STREET AND SHADOW LAKE ROAD	Sal-Pla-Win	2013
		Bedford	Widen NH 101 to 5 lanes from Wallace Road up to Amherst Town Line	Manchester	2025
		Bedford	Widen US 3 to 5 lanes from Bridge over FE Everett Turnpike to Merrimack Town Line	Manchester	2025
		Bedford/Hooksett	Electronic Toll Collection	Manchester	
		Derry	Widen NH 28 to 5 lanes from Ross's Corner to Londonderry Town Line	Manchester	2010

Exhibit 7.
2002 HPMS VMT EMISSIONS

Seacoast Nonattainment area 2002

Group	FC	HPMS Corrected Total Summer DVMT	Weighted Average Speed	HC	NOx	Emissions HC	NOx	Speed
1	1	922,080	59	1.017	2.523	937.8	2326.4	54402720
1	2	705,472	55	1.029	2.347	725.9	1655.7	38800960
1	6	528,900	43	1.072	1.901	567.0	1005.4	22742700
1	7	425,162	37	1.108	1.850	471.1	786.5	15730994
1	8	113,699	37	1.108	1.850	126.0	210.3	4206863
1	9	159,830	25	1.255	1.933	203.5	309.0	3995750
1	11	394,287	52	1.039	2.246	409.7	885.6	20502924
1	12	894,105	52	1.039	2.246	929.0	2008.2	46493460
1	14	827,924	45	1.062	1.922	879.3	1591.3	37256580
1	16	1,241,191	30	1.182	1.863	1467.1	2312.3	37235730
1	17	288,681	25	1.255	1.933	362.3	558.0	7217025
1	19	321,752	25	1.255	1.933	403.8	621.9	8043800
		6,823,083				7482.3	14270.7	296629506
								43

Southern Nonattainment area 2002

Group	FC	HPMS Corrected Total Summer DVMT	Weighted Average Speed	HC	NOx	Emissions HC	NOx	Speed
2	1	1,890,033	62	1.013	2.604	1914.6	4921.6	117182046
2	2	1,012,738	58	1.020	2.473	1033.0	2504.5	58738804
2	6	609,770	42	1.077	1.890	656.7	1152.5	25610340
2	7	820,898	37	1.108	1.850	909.6	1518.7	30373226
2	8	182,731	37	1.108	1.850	202.5	338.1	6761047
2	9	303,938	25	1.255	1.933	381.4	587.5	7598450
2	11	308,299	57	1.023	2.421	315.4	746.4	17573043
2	12	907,494	57	1.023	2.421	928.4	2197.0	51727158
2	14	1,109,877	35	1.122	1.838	1245.3	2040.0	38845695
2	16	1,504,748	29	1.194	1.875	1796.7	2821.4	43637692
2	17	440,741	25	1.255	1.933	553.1	852.0	11018525
2	19	540,375	25	1.255	1.933	678.2	1044.5	13509375
		9,631,642				10614.8	20724.1	422575401

Exhibit 8.
MOBILE6.2 inputs

Sample Input data: 2002-AR.in

```
MOBILE6 INPUT FILE :
> FILE NAME: 2002-AR.in
> DATE: 2-22-05
> CREATED BY: REO
> INPUT FILE FOR MOBILE6.2 for 2002
> NH VEH REG DATA ADJUSTED FOR 2002
> VMT FRACTION DEVELOPED IN MAY 2002 FROM 1999 HPMS DATA AND VISUAL COUNTS, AND
> ADJUSTED TO CURRENT YEAR BASED ON MOBILE6.2 DEFAULTS
* (H:\MOBILE6.2\VMT MIX\2-18-05 VMT mix adjustment - add 2009.xls)
> NON-ATTAINMENT AREA
> SUMMER SEASON
> USE FOR OUTPUT - 2005-2025 8 HOUR STANDARD CONFORMITY DETERMINATION
> RFG, NLEV NE, ESI(ATP), NO OBD
> ARTERIAL ROADWAY

* Make sure that Report File matches the Input File
REPORT FILE         : H:\Mobile62\Run\0525conf\8Hour\2002-AR.out

POLLUTANTS          : HC NOx CO

RUN DATA

NO REFUELING        :

94+ LDG IMP         : NLEVNE.D

> NEW HAMPSHIRE DATA FOR MIN/MAX TEMP, FUEL RVP, VMT FRACTIONS, ESI/ATP, FUEL,
SEASON

MIN/MAX TEMP        : 62. 92.
FUEL RVP            : 6.8
EXPRESS HC AS VOC   :

*New Hampshire Vehicle Registration Distribution Input (External File)
REG DIST            : H:\Mobile6\Run\NHallage.d

*New Hampshire 2002 VMT Fractions from file H:\Mobile6.2\VMT Mix\5-17-04 VMT mix
*adjustment.xls
* HDV5 value of 0.0015 changed to 0.0014 and HDBS value of 0.0012 changed to
0.0011 to make
* VMT fractions add up to 1.000

VMT FRACTIONS       :
0.5355  0.0701  0.2330  0.0551  0.0253  0.0247  0.0024  0.0020
0.0014  0.0055  0.0065  0.0070  0.0252  0.0011  0.0006  0.0046

*New Hampshire ESI Program is ATP
ANTI-TAMP PROG      :
99 80 50 22222 11111111 1 11 096. 22211122


*New Hampshire specific fuel program shown below (2 N for RFG, 1 for
Conventional East)
FUEL PROGRAM        : 2 N
```

```
*NEW Hampshire Season of interest (1 for summer, 2 for winter)
SEASON              : 1

> Scenario(s) being modeled includes area, road class, type, speed, year, month

SCENARIO RECORD     : Scenario Title : NH speed 65
> 2002 Speed 65 mph (Arterial)
* This text is for annotating this file and is otherwise ignored.
CALENDAR YEAR       : 2002
EVALUATION MONTH    : 7
ALTITUDE            : 1
AVERAGE SPEED       : 65 Arterial 0.0 100.0 0.0 0.0
```

...other speeds cut...

```
SCENARIO RECORD     : Scenario Title : NH speed 2.5
> 2002 Speed 2.5 mph (Arterial)
* This text is for annotating this file and is otherwise ignored.
CALENDAR YEAR       : 2002
EVALUATION MONTH    : 7
ALTITUDE            : 1
AVERAGE SPEED       : 2.5 Arterial 0.0 100.0 0.0 0.0


END OF RUN          :
```

Sample Input data: 10CO-AR.in

```
MOBILE6 INPUT FILE :
* FILE NAME: 10CO-AR.in
> DATE: 2-22-05
* CREATED BY: REO
* INPUT FILE FOR MOBILE6.2 for 2010
* VMT FRACTION DEVELOPED BY NH DOT IN MAY 2002 FROM 1999 HPMS DATA AND VISUAL
COUNTS, AND
* ADJUSTED TO CURRENT YEAR BASED ON MOBILE6.2 DEFAULTS
* (H:\MOBILE6.2\VMT MIX\2-18-05 VMT mix adjustment - add 2009.xls)
* NON-ATTAINMENT AREA
* WINTER
* USE FOR OUTPUT - 2005-2025 CONFORMITY DETERMINATION SPRING 2005
* RFG, NLEV NE, ESI(ATP), OBDII STARTING IN 2005
* RVP set at 12.9 per EPA guidance

> Make sure that Report File matches the Input File
REPORT FILE         : H:\Mobile62\Run\0525conf\8Hour\10CO-AR.out

POLLUTANTS          : CO

RUN DATA

NO REFUELING        :

94+ LDG IMP         : NLEVNE.D

> NEW HAMPSHIRE DATA FOR MIN/MAX TEMP, FUEL RVP, VMT FRACTIONS, ESI/ATP, FUEL,
SEASON
```

```
MIN/MAX TEMP        : 30. 30.
FUEL RVP            : 12.9
EXPRESS HC AS VOC   :

*New Hampshire Vehicle Registration Distribution Input (External File)
REG DIST            : H:\Mobile62\Run\NHallage.d

*New Hampshire 2010 VMT Fractions from file H:\Mobile6.2\VMT Mix\5-17-04 VMT mix
adjustment.xls

VMT FRACTIONS       :
0.4189  0.0907  0.3015  0.0713  0.0328  0.0259  0.0025  0.0021
0.0017  0.0058  0.0068  0.0074  0.0264  0.0013  0.0007  0.0042

> the following assumptions are made for the I/M program:  NH's OBD program
begins in 2005,
> and applies to all 1996 and newer light duty vehicles.  The program type is
"Test and
> Repair, Computerized"; stringency assumptions are set at 50%.  EPA has said
that because the
> stringency does not apply to NH program as pre-81 vehicles are not subject to
I/M the value
> of this number is inconsequential; NH offers no waivers.


I/M PROGRAM         : 1 2005 2050 1 TRC OBD I/M

I/M MODEL YEARS     : 1 1996 2050

I/M VEHICLES        : 1 22222 11111111 1

I/M STRINGENCY      : 1 50.0

I/M COMPLIANCE      : 1 96.0

I/M WAIVER RATES    : 1 0.0 0.0

I/M PROGRAM         : 2 2005 2050 1 TRC EVAP OBD

I/M MODEL YEARS     : 2 1996 2050

I/M VEHICLES        : 2 22222 11111111 1

I/M STRINGENCY      : 2 50.0

I/M COMPLIANCE      : 2 96.0

I/M WAIVER RATES    : 2 0.0 0.0

ANTI-TAMP PROG      :
99 80 95 22222 11111111 1 11 096. 22211122

*fuel program shown below (2 N for RFG, 1 for Conventional East)
FUEL PROGRAM        : 2 N

*Season of interest (1 for summer, 2 for winter)
```

```
SEASON              : 2

> Scenario(s) being modeled includes area, road class, type, speed, year, month

SCENARIO RECORD     : Scenario Title : NH speed 65
> 2010 Speed 65 mph (Arterial)
CALENDAR YEAR       : 2010
EVALUATION MONTH    : 1
ALTITUDE            : 1
AVERAGE SPEED       : 65 Arterial 0.0 100.0 0.0 0.0
```

…other speeds cut…

```
SCENARIO RECORD     : Scenario Title : NH speed 2.5
> 2010 Speed 2.5 mph (Arterial)
CALENDAR YEAR       : 2010
EVALUATION MONTH    : 1
ALTITUDE            : 1
AVERAGE SPEED       : 2.5 Arterial 0.0 100.0 0.0 0.0


END OF RUN          :
```

Sample Input data: 2025-FR.in

```
MOBILE6 INPUT FILE :
> FILE NAME: 2025-FR.in
> DATE: 2-22-05
> CREATED BY: REO
> INPUT FILE FOR MOBILE6.2 for 2025
> VMT FRACTION DEVELOPED BY NH DOT IN MAY 2002 FROM 1999 HPMS DATA AND VISUAL
COUNTS, AND
> ADJUSTED TO CURRENT YEAR BASED ON MOBILE6.2 DEFAULTS
* (H:\MOBILE6.2\VMT MIX\2-18-05 VMT mix adjustment - add 2009.xls)
> NON-ATTAINMENT AREA
> SUMMER SEASON
> USE FOR OUTPUT - 2005-2025 8 HOUR STANDARD CONFORMITY DETERMINATION
> RFG, NLEV NE, ESI(ATP), OBDII STARTING IN 2005

> Make sure that Report File matches the Input File
REPORT FILE         : H:\Mobile62\Run\0525conf\8Hour\2025-FR.out

POLLUTANTS          : HC NOx CO

RUN DATA

NO REFUELING        :

94+ LDG IMP         : NLEVNE.D

> NEW HAMPSHIRE DATA FOR MIN/MAX TEMP, FUEL RVP, VMT FRACTIONS, ESI/ATP, FUEL,
SEASON

MIN/MAX TEMP        : 62. 92.
FUEL RVP            : 6.8
EXPRESS HC AS VOC   :
```

```
*New Hampshire Vehicle Registration Distribution Input (External File)
REG DIST            : H:\Mobile62\Run\NHallage.d

*New Hampshire 2025 VMT Fractions from file H:\Mobile6.2\VMT Mix\5-26-04 VMT mix
adjustment.xls

VMT FRACTIONS       :
0.3360  0.1053  0.3503  0.0829  0.0381  0.0267  0.0026  0.0022
0.0018  0.0060  0.0071  0.0077  0.0273  0.0013  0.0007  0.0040

> the following assumptions are made for the I/M program:  NH's OBD program
begins in 2005,
> and applies to all 1996 and newer light duty vehicles.  The program type is
"Test and
> Repair, Computerized"; stringency assumptions are set at 50%.  EPA has said
that because the
> stringency does not apply to NH program as pre-81 vehicles are not subject to
I/M the value
> of this number is inconsequential; NH offers no waivers.


I/M PROGRAM         : 1 2005 2050 1 TRC OBD I/M

I/M MODEL YEARS     : 1 1996 2050

I/M VEHICLES        : 1 22222 11111111 1

I/M STRINGENCY      : 1 50.0

I/M COMPLIANCE      : 1 96.0

I/M WAIVER RATES    : 1 0.0 0.0

I/M PROGRAM         : 2 2005 2050 1 TRC EVAP OBD

I/M MODEL YEARS     : 2 1996 2050

I/M VEHICLES        : 2 22222 11111111 1

I/M STRINGENCY      : 2 50.0

I/M COMPLIANCE      : 2 96.0

I/M WAIVER RATES    : 2 0.0 0.0

ANTI-TAMP PROG      :
99 80 95 22222 11111111 1 11 096. 22211122

*fuel program shown below (2 N for RFG, 1 for Conventional East)
FUEL PROGRAM        : 2 N

*Season of interest (1 for summer, 2 for winter)
SEASON              : 1

> Scenario(s) being modeled includes area, road class, type, speed, year, month
```

```
SCENARIO RECORD     : Scenario Title : NH speed 60.7 and greater
> 2025 Speed 60.7 mph and greater (Freeway)
* This text is for annotating this file and is otherwise ignored.
CALENDAR YEAR       : 2025
EVALUATION MONTH    : 7
ALTITUDE            : 1
AVERAGE SPEED       : 60.7 Freeway 92.0 0.0 0.0 8.0

SCENARIO RECORD     : Scenario Title : NH speed 60
> 2025 Speed 60 mph (Freeway)
* This text is for annotating this file and is otherwise ignored.
CALENDAR YEAR       : 2025
EVALUATION MONTH    : 7
ALTITUDE            : 1
AVERAGE SPEED       : 60 Freeway 92.0 0.0 0.0 8.0
```

…other speeds cut…

```
SCENARIO RECORD     : Scenario Title : NH speed 3
> 2025 Speed 3 mph (Freeway)
* This text is for annotating this file and is otherwise ignored.
CALENDAR YEAR       : 2025
EVALUATION MONTH    : 7
ALTITUDE            : 1
AVERAGE SPEED       : 3 Freeway 92.0 0.0 0.0 8.0


END OF RUN          :
```

Exhibit 9.
Off Model analysis for Manchester Marginal area

Off model analysis for Statewide 14265 [04-34CM], Creation of a Transportation Management Center

From FHWA Resource Center, AIR QUALITY TEAM
Off-Model Air Quality Analysis: A Compendium of Practice
http://www.fhwa.dot.gov/resourcecenter/teams/airquality/pubs2.cfm

The main goal of an Incident Management Program is to reduce congestion by removing vehicles which are debilitated, injured or just broke. Nonrecurring Congestion is the effect these vehicles have on the main line flow. Excess freeway emission are caused by this type of congestion. This analysis provides the basis for calculation of reduction of VOCs due to these programs; however, NOx can be analyzed in a similar fashion.

a) Determine Regional Freeway VOC Emissions, EB.

b) Determine Freeway Emissions due to Nonrecurring Congestion, EC.
EC = EB * 0.049
Note: 4.9 Percent of Freeway Emissions are Caused by Nonrecurring Congestion.5

c) Next the Daily VOC reductions, ED, are calculated. These assume, since freeway emissions are directly related to VMT, that the VMT in the program area is used to calculate emission reductions.

ED = L * VOLi * EC / VOLT * EFF

where,

L = Length of Freeway
VOLi = Volume of Freeway i
VOLT = Regional Freeway VMT

EFF = Project Effectiveness, 50% for Incident Detection and Response, 25% for Motorist Assistance, and 15% for Surveillance.
Use 15% effectiveness

Assume average speed >= 60.7 mph

2007
Freeway

Speed	VOC Summer	NOx Summer
60.7	0.602	1.588

2009
Freeway

Speed	VOC Summer	NOx Summer
60.7	0.501	1.275

Emission Factors, from DES on 2/23/05

SID	DYNSEG_ID	STREET	FROM_MP	TO_MP	COUNTER_ID	FC	2003 AADT (2 way)	Growth%	2007 AADT (1 way)	2009 AADT (1 way)	2007 VMT	2009 VMT	2007 Emissions - VOC	2007 Emissions - NOx	2009 Emissions - VOC	2009 Emissions - NOx
037:0632:0626	037:9991:N	F.e. Everett Tpk	2.78063052	3.20564757	02037090	12	47338	1.02	25,620	26,655	10,889	11,329	6.820	17.990	5.676	14.444
037:0259:0632	037:9991:N	F.e. Everett Tpk	2.75763983	2.78063052	02037090	12	47338	1.02	25,620	26,655	589	613	0.369	0.973	0.307	0.782
037:0631:0633	037:9991:S	F E Everett Tpk	1.09982481	1.21602099	02037090	12	47338	1.02	25,620	26,655	2,977	3,097	1.864	4.918	1.552	3.949
037:0624:0631	037:9991:S	F E Everett Tpk	0.74875079	1.09982481	02037090	12	47338	1.02	25,620	26,655	8,995	9,358	5.634	14.861	4.688	11.931
285:0936:2536	285:9991:N	Fee Tpk & I-293	1.12157276	2.54637405	02285002	11	46854	1.03	26,368	27,973	37,568	39,856	23.993	63.291	19.968	50.816
285:0917:0936	285:9991:N	Fee Tpk & I-293	0.87364615	1.12157276	02285002	11	46854	1.03	26,368	27,973	6,537	6,935	4.175	11.013	3.474	8.842
285:2531:2535	285:9991:S	Fee Tpk & I-293	2.92913794	3.21248264	02285002	11	46854	1.03	26,368	27,973	7,471	7,926	4.771	12.586	3.971	10.106
285:0935:0715	285:9991:S	Fee Tpk & I-293	4.41110527	5.01507686	02285002	11	46854	1.03	26,368	27,973	15,925	16,895	10.171	26.829	8.464	21.541
285:2535:0935	285:9991:S	Fee Tpk & I-293	3.21248264	4.41110527	02285002	11	46854	1.03	26,368	27,973	31,605	33,529	20.184	53.244	16.798	42.749
285:2815:2531	285:9991:S	Fee Tpk & I-293	2.85892314	2.92913794	02285002	11	46854	1.03	26,368	27,973	1,851	1,964	1.182	3.119	0.984	2.504
225:8339:0107	225:0999:N	Alan B Shepard	1.33967361	1.45649116	02285092	1	53000	1.03	29,826	31,643	3,484	3,696	2.225	5.869	1.852	4.712
225:0107:0104	225:0999:N	Alan B Shepard	1.45649116	1.59940625	02285092	1	53000	1.03	29,826	31,643	4,263	4,522	2.722	7.181	2.266	5.766
225:0099:0098	225:0999:S	Alan B Shepard	4.95418260	5.05360180	02285092	1	53000	1.03	29,826	31,643	2,965	3,146	1.894	4.996	1.576	4.011
225:0098:8340	225:0999:S	Alan B Shepard	5.05360180	5.18533222	02285092	1	53000	1.03	29,826	31,643	3,929	4,168	2.509	6.619	2.088	5.314
285:8336:8339	285:0999:N	Alan B Shepard Hwy	6.56042392	7.13022016	02285092	11	53000	1.03	29,826	31,643	16,995	18,030	10.854	28.632	9.033	22.988
285:8340:8335	285:0999:S	Alan B Shepard Hwy	0.00000000	0.56979624	02285092	11	53000	1.03	29,826	31,643	16,995	18,030	10.854	28.632	9.033	22.988
225:0046:8336	225:0999:N	Alan B Sheppard	0.74502257	1.33967361	02285092	11	53000	1.03	29,826	31,643	17,736	18,816	11.327	29.880	9.427	23.990
225:0028:0046	225:0999:N	Alan B Sheppard	0.43558033	0.74502257	02285092	11	53000	1.03	29,826	31,643	9,229	9,792	5.895	15.550	4.906	12.485
225:0044:0038	225:0999:S	Alan B Sheppard	5.73586600	5.98503535	02285092	11	53000	1.03	29,826	31,643	7,432	7,884	4.746	12.520	3.950	10.052
225:0038:0024	225:0999:S	Alan B Sheppard	5.98503535	6.17268907	02285092	11	53000	1.03	29,826	31,643	5,597	5,938	3.575	9.430	2.975	7.571
225:8335:0044	225:0999:S	Alan B Sheppard	5.18533222	5.73586600	02285092	11	53000	1.03	29,826	31,643	16,420	17,420	10.487	27.663	8.727	22.211
225:0121:0242	225:0999:N	Alan B Shepard	2.03809343	2.61348201	61285153	1	19432	1.01	10,111	10,314	5,817	5,934	3.572	9.423	2.973	7.566
225:0104:0121	225:0999:N	Alan B Shepard	1.59940625	2.03809343	61285153	1	19432	1.01	10,111	10,314	4,435	4,524	2.723	7.184	2.267	5.768
225:0119:0099	225:0999:S	Alan B Shepard	4.71930476	4.95418260	61285154	1	19432	1.01	10,111	10,314	2,375	2,422	1.458	3.846	1.213	3.088
037:0626:6116	037:9991:N	Fee Tpk & I-293	3.20564757	3.98422411	62037058	11	67000	1.03	37,705	40,001	29,356	31,144	18.749	49.457	15.603	39.709
037:6117:0624	037:9991:S	Fee Tpk & I-293	0.00000000	0.74875079	62037058	11	67000	1.03	37,705	40,001	28,231	29,951	18.031	47.562	15.005	38.188
285:6116:0697	285:9991:N	Fee Tpk & I-293	0.00000000	0.29080114	62037058	11	67000	1.03	37,705	40,001	10,965	11,632	7.002	18.472	5.828	14.831
285:0697:0917	285:9991:N	Fee Tpk & I-293	0.29080114	0.87364615	62037058	11	67000	1.03	37,705	40,001	21,976	23,314	14.035	37.023	11.680	29.725
285:0698:6117	285:9991:S	Fee Tpk & I-293	5.13562263	5.55069775	62037058	11	67000	1.03	37,705	40,001	15,650	16,603	9.995	26.366	8.318	21.169
225:0297:0304	225:0999:N	Alan B Shepard	4.67208065	4.89328835	62225060	1	61000	1.01	31,739	32,377	7,021	7,162	4.312	11.373	3.588	9.132
225:0304:6207	225:0999:N	Fee Trpk	4.89328835	6.41626609	62225060	1	61000	1.01	31,739	32,377	48,337	49,309	29.684	78.303	24.704	62.869
225:0303:0286	225:0999:S	Fe Everett Tpk	1.57268734	1.83614820	62225060	1	61000	1.01	31,739	32,377	8,362	8,530	5.135	13.546	4.274	10.876
225:6208:0303	225:0999:S	Fe Everett Tpk	0.00000000	1.57268734	62225060	1	61000	1.01	31,739	32,377	49,915	50,918	30.653	80.858	25.510	64.920
225:8343:0120	225:9991:N	F. E. Everett Hwy	0.00000000	0.48094034	62225068	1	32000	1.03	18,008	19,105	8,661	9,188	5.531	14.591	4.603	11.715
225:0120:0242	225:9991:N	Fee Tpk	0.48094034	1.31978977	62225068	1	32000	1.03	18,008	19,105	15,106	16,026	9.648	25.449	8.029	20.433
225:0122:8344	225:9991:S	F. E. Everett Hwy	0.66300174	1.31978977	62225068	1	32000	1.03	18,008	19,105	11,827	12,548	7.554	19.926	6.287	15.999
225:0248:0122	225:9991:S	Fee Tpk	0.00000000	0.66300174	62225068	1	32000	1.03	18,008	19,105	11,939	12,667	7.626	20.115	6.346	16.150
285:3063:8343	285:9991:N	Fee Tpk & I-293	3.56044981	5.55069775	62225068	11	32000	1.03	18,008	19,105	35,840	38,024	22.890	60.382	19.050	48.481
285:2884:3063	285:9991:N	Fee Tpk & I-293	3.09069413	3.56044981	62225068	11	32000	1.03	18,008	19,105	8,459	8,975	5.403	14.252	4.496	11.443
285:8344:3059	285:9991:S	Fee Tpk & I-293	0.00000000	2.10458002	62225068	11	32000	1.03	18,008	19,105	37,899	40,208	24.205	63.850	20.144	51.265
225:0242:0288	225:0999:N	Alan B Shepard	2.61348201	4.27005429	62225083	1	64000	1.01	33,300	33,969	55,163	56,271	33.875	89.358	28.192	71.746
225:0286:0287	225:0999:S	Fe Everett Tpk	1.83614820	2.01510274	62225083	1	64000	1.01	33,300	33,969	5,959	6,079	3.660	9.653	3.046	7.751
225:0287:0248	225:0999:S	Fe Everett Tpk	2.01510274	3.23174510	62225083	1	64000	1.01	33,300	33,969	40,514	41,328	24.879	65.629	20.705	52.693
285:8709:0247	285:0999:N	Alan B Shepard Hwy	0.00000000	1.71187421	62269002	11	77000	1.03	43,332	45,971	74,179	78,697	47.376	124.971	39.427	100.339
285:0246:8708	285:0999:S	Alan B Shepard Hwy	5.40778267	7.13022016	62269002	11	77000	1.03	43,332	45,971	74,637	79,182	47.668	125.741	39.670	100.957
285:0261:1344	285:0999:N	Alan B Shepard Hwy	2.71414394	3.45419555	62285059	11	101000	1.03	56,838	60,300	42,063	44,625	26.864	70.865	22.357	56.897
285:1344:1377	285:0999:N	Alan B Shepard Hwy	3.45419555	4.04201152	62285059	11	101000	1.03	56,838	60,300	33,410	35,445	21.338	56.287	17.758	45.192
285:0247:0261	285:0999:N	Alan B Shepard Hwy	1.71187421	2.71414394	62285059	11	101000	1.03	56,838	60,300	56,967	60,436	36.382	95.972	30.278	77.056
285:1343:0262	285:0999:S	Alan B Shepard Hwy	3.66173311	4.33778361	62285059	11	101000	1.03	56,838	60,300	38,425	40,766	24.541	64.736	20.424	51.977
285:1375:1343	285:0999:S	Alan B Shepard Hwy	3.04906234	3.66173311	62285059	11	101000	1.03	56,838	60,300	34,823	36,944	22.240	58.667	18.509	47.104
285:0262:0246	285:0999:S	Alan B Shepard Hwy	4.33778361	5.40778267	62285059	11	101000	1.03	56,838	60,300	60,817	64,520	38.841	102.458	32.325	82.263
285:2997:2677	285:0032:W	Southside Rd	0.00683507	0.34734580	62285060	12	49000	1.02	26,520	27,591	9,030	9,395	5.656	14.919	4.707	11.979
285:2677:1442	285:0032:W	Southside Rd	0.34734580	1.37322759	62285060	12	49000	1.02	26,520	27,591	27,206	28,305	17.040	44.948	14.181	36.089
037:6115:0248	037:9993:N	I 293 Nb	0.00000000	0.21312989	62285128	11	78000	1.03	43,895	46,568	9,355	9,925	5.975	15.761	4.972	12.654

SID	DYNSEG_ID	STREET	FROM_MP	TO_MP	COUNTER_ID	FC	2003 AADT (2 way)	Growth%	2007 AADT (1 way)	2009 AADT (1 way)	2007 VMT	2009 VMT	2007 Emissions - VOC	2007 Emissions - NOx	2009 Emissions - VOC	2009 Emissions - NOx
037:02[illegible]:6114	037:9993:S	I 293 Sb	0.99046370	1.27318703	62285128	11	78000	1.03	43,895	46,568	12,410	13,166	7.926	20.908	6.596	16.787
285:0116:0115	285:9993:N	101 By Pass	2.50784911	2.78187326	62285128	11	78000	1.03	43,895	46,568	12,028	12,761	7.682	20.264	6.393	16.270
285:0199:0116	285:9993:N	101 By Pass	1.81564299	2.50784911	62285128	11	78000	1.03	43,895	46,568	30,384	32,235	19.405	51.189	16.150	41.100
285:0115:6115	285:9993:N	101 By Pass	2.78187326	3.02979987	62285128	11	78000	1.03	43,895	46,568	10,883	11,545	6.950	18.333	5.784	14.720
285:0066:0117	285:9993:S	101 By Pass	0.15658523	0.52132939	62285128	11	78000	1.03	43,895	46,568	16,010	16,985	10.225	26.972	8.509	21.656
285:6114:0066	285:9993:S	101 By Pass	0.00000000	0.15658523	62285128	11	78000	1.03	43,895	46,568	6,873	7,292	4.390	11.580	3.653	9.297
285:0117:0198	285:9993:S	101 By Pass	0.52132939	1.20980729	62285128	11	78000	1.03	43,895	46,568	30,221	32,061	19.301	50.913	16.063	40.878
285:0248:0312	285:9993:N	101 By Pass	0.72886695	1.49377336	62285129	11	80000	1.03	45,021	47,762	34,436	36,533	21.993	58.014	18.303	46.580
285:0312:0199	285:9993:N	101 By Pass	1.49377336	1.81564299	62285129	11	80000	1.03	45,021	47,762	14,491	15,373	9.255	24.412	7.702	19.601
285:0198:0311	285:9993:S	101 By Pass	1.20980729	1.51800679	62285129	11	80000	1.03	45,021	47,762	13,875	14,720	8.861	23.375	7.375	18.768
285:0311:0249	285:9993:S	101 By Pass	1.51800679	2.29720470	62285129	11	80000	1.03	45,021	47,762	35,080	37,216	22.404	59.099	18.645	47.450
285:1480:1562	285:0999:N	Alan B Shepard Hwy	4.70128503	5.18222537	62285150	11	71000	1.03	39,956	42,389	19,216	20,387	12.273	32.375	10.214	25.993
285:1377:1480	285:0999:N	Alan B Shepard Hwy	4.04201152	4.70128503	62285150	11	71000	1.03	39,956	42,389	26,342	27,946	16.823	44.378	14.001	35.631
285:1481:3790	285:0999:S	Alan B Shepard Hwy	0.00000000	2.77500000	62285150	11	71000	1.03	39,956	42,389	110,877	117,629	70.813	186.795	58.932	149.977
285:1563:1481	285:0999:S	Alan B Shepard Hwy	1.94053835	2.49045076	62285150	11	71000	1.03	39,956	42,389	21,972	23,310	14.033	37.016	11.678	29.720
285:1565:8328	285:0999:N	Alan B Shepard Hwy	5.60351420	6.56042392	62285152	11	65000	1.03	36,579	38,807	35,003	37,134	22.355	58.969	18.604	47.346
285:1562:1565	285:0999:N	Alan B Shepard Hwy	5.18222537	5.60351420	62285152	11	65000	1.03	36,579	38,807	15,410	16,349	9.842	25.962	8.191	20.845
285:8327:1575	285:0999:S	Alan B Shepard Hwy	0.56979624	1.63730982	62285152	11	65000	1.03	36,579	38,807	39,049	41,426	24.938	65.784	20.754	52.818
285:1575:1563	285:0999:S	Alan B Shepard Hwy	1.63730982	1.94053835	62285152	11	65000	1.03	36,579	38,807	11,092	11,767	7.084	18.686	5.895	15.003
225:8328:0023	225:0999:N	Alan B Sheppard	0.00000000	0.07704987	62285152	11	65000	1.03	36,579	38,807	2,818	2,990	1.800	4.748	1.498	3.812
225:0023:0025	225:0999:N	Alan B Sheppard	0.07704987	0.37406471	62285152	11	65000	1.03	36,579	38,807	10,865	11,526	6.939	18.303	5.775	14.696
225:0024:8327	225:0999:S	Alan B Sheppard	6.17268907	6.46535432	62285152	11	65000	1.03	36,579	38,807	10,705	11,357	6.837	18.035	5.690	14.480
037:0248:0626	037:9993:N	I 293 Nb	0.21312989	1.18433112	81037065	11	13000	1.03	7,316	7,762	7,105	7,538	4.538	11.970	3.777	9.611
037:0623:0260	037:9993:S	I 293 Sb	0.39084170	0.49212500	81037074	11	13000	1.03	7,316	7,762	741	786	0.473	1.248	0.394	1.002
037:0624:0625	037:9993:S	I 293 Sb	0.00000000	0.22245044	81037074	11	13000	1.03	7,316	7,762	1,627	1,727	1.040	2.742	0.865	2.202
037:0625:0623	037:9993:S	I 293 Sb	0.22245044	0.39084170	81037074	11	13000	1.03	7,316	7,762	1,232	1,307	0.787	2.076	0.655	1.666
285:1441:2876	285:0032:E	Southside Rd	0.65803078	1.68950489	81285083	12	17000	1.02	9,201	9,573	9,490	9,874	5.944	15.680	4.947	12.589
285:1376:1441	285:0032:E	Southside Rd	0.02423343	0.65803078	81285083	12	17000	1.02	9,201	9,573	5,831	6,067	3.652	9.634	3.040	7.735
285:1377:1376	285:0032:E	Southside Rd	0.00000000	0.02423343	81285083	12	17000	1.02	9,201	9,573	223	232	0.140	0.368	0.116	0.296
285:1442:1378	285:0032:W	Southside Rd	1.37322759	2.02690677	81285085	12	17000	1.02	9,201	9,573	6,014	6,257	3.767	9.936	3.135	7.978
285:0249:0261	285:9993:S	101 By Pass	2.29720470	3.02979987	81285145	11	26000	1.03	14,632	15,523	10,719	11,372	6.846	18.059	5.697	14.499
285:0262:0248	285:9993:N	101 By Pass	0.00000000	0.72886695	81285146	11	26000	1.03	14,632	15,523	10,664	11,314	6.811	17.967	5.668	14.425
										Total VMTs	1,727,857	1,822,123				
												Total Emissions	1096.918	2893.531	912.884	2323.207
												Nonrecurring Congestion Emissions	53.749	141.783	44.731	113.837

	2007 VMT	2009 VMT
Total VMTs (from previous page)	1,727,857	1,822,123

	2007 Emissions - VOC	2007 Emissions - NOx	2009 Emissions - VOC	2009 Emissions - NOx
Nonrecurring Congestion Emissions (from previous page)	53.749	141.783	44.731	113.837

From SNHPC's Air Quality Analysis

Year	Scenario	VMTs	VOC Em.	NOx Em.
2007	Build	6,755,946	4,676	8,286
2009	Build	7,010,595	3,904	6,781

Emission reductions = Ratio of highway VMTs to total area VMTs * Nonrecurring Congestion Emissions * Effectiveness

2007 VOC Emission reductions = 1727857 / 6755946 * 53.749 * 0.15

2.062

Year	VOC Em. Red.	NOx Em. Red.
2007	2.062	5.439
2009	1.744	4.438

NONATTAINMENT AREA : MANCHESTER MARGINAL OZONE

VOC (HCs) in kg/day

	PORTION MANCHESTER MPO AREA From MPO report	Less project benefits	Emissions
2007 BUILD	4,561	(2.062)	4,559
2009 BUILD	3,901	(1.744)	3,899
2017 BUILD	2,151		2,151
2025 BUILD	1,701		1,701

NOx in kg/day

	PORTION MANCHESTER MPO AREA From MPO report	Less project benefits	Emissions
2007 BUILD	8,151	(5.439)	8,146
2009 BUILD	6,779	(4.438)	6,775
2017 BUILD	2,836		2,836
2025 BUILD	1,688		1,688

Exhibit 10.
Towns Located in Nonattainment Area and Modeling Responsibility

Towns located in Nonattainment Area and Modeling Responsibility

Planning Commission	MPO	Towns in Ozone Non-attainment Areas	8 Hour Area	1 Hour Area	1 Hour Area Name	Modeled By
NRPC	NRPC	Amherst	*	*	Bos-Law-Worcester	NRPC
RPC	SPW	Atkinson	*	*	Bos-Law-Worcester	Seacoast MPO
SNHPC	SNHPC	Auburn	*	*	Manchester	SNHPC
SRPC	Seacoast	Barrington		*	Ports-Dover-Roch	Seacoast MPO
SNHPC	SNHPC	Bedford	*	*	Manchester	SNHPC
RPC	Seacoast	Brentwood	*	*	Bos-Law-Worcester	Seacoast MPO
NRPC	NRPC	Brookline	*	*	Bos-Law-Worcester	NRPC
SNHPC	SNHPC	Candia	*	*	Manchester	SNHPC
SNHPC	SNHPC	Chester	*	*	Manchester	SNHPC
RPC	SPW	Danville	*	*	Bos-Law-Worcester	Seacoast MPO
SNHPC	SNHPC	Derry	*	*	Bos-Law-Worcester	SNHPC
SRPC	Seacoast	Dover	*	*	Ports-Dover-Roch	Seacoast MPO
SRPC	Seacoast	Durham	*	*	Ports-Dover-Roch	Seacoast MPO
RPC	SPW	East Kingston	*	*	Ports-Dover-Roch	Seacoast MPO
RPC	Seacoast	Epping	*	*	Manchester	Seacoast MPO
RPC	Seacoast	Exeter	*	*	Ports-Dover-Roch	Seacoast MPO
SRPC	Seacoast	Farmington		*	Ports-Dover-Roch	Seacoast MPO
RPC	Seacoast	Fremont	*	*	Manchester	Seacoast MPO
SNHPC	SNHPC	Goffstown	*	*	Manchester	SNHPC
RPC	Seacoast	Greenland	*	*	Ports-Dover-Roch	Seacoast MPO
RPC	SPW	Hampstead	*	*	Bos-Law-Worcester	Seacoast MPO
RPC	Seacoast	Hampton	*	*	Ports-Dover-Roch	Seacoast MPO
RPC	Seacoast	Hampton Falls	*	*	Ports-Dover-Roch	Seacoast MPO
NRPC	NRPC	Hollis	*	*	Bos-Law-Worcester	NRPC
SNHPC	SNHPC	Hooksett	*	*	Manchester	SNHPC
NRPC	NRPC	Hudson	*	*	Bos-Law-Worcester	NRPC
RPC	Seacoast	Kensington	*	*	Bos-Law-Worcester	Seacoast MPO
RPC	Seacoast	Kingston	*	*	Ports-Dover-Roch	Seacoast MPO
SRPC	Seacoast	Lee		*	Ports-Dover-Roch	Seacoast MPO
NRPC	NRPC	Litchfield	*	*	Bos-Law-Worcester	NRPC
SNHPC	SNHPC	Londonderry	*	*	Bos-Law-Worcester	SNHPC
SRPC	Seacoast	Madbury		*	Ports-Dover-Roch	Seacoast MPO
SNHPC	SNHPC	Manchester	*	*	Manchester	SNHPC
NRPC	NRPC	Merrimack	*	*	Bos-Law-Worcester	NRPC
SRPC	Seacoast	Middleton		*	Ports-Dover-Roch	Seacoast MPO

Towns located in Nonattainment Area and Modeling Responsibility

Planning Commission	MPO	Towns in Ozone Non-attainment Areas	8 Hour Area	1 Hour Area	1 Hour Area Name	Modeled By
NRPC	NRPC	Milford	*	*	Bos-Law-Worcester	NRPC
NRPC	NRPC	Mont Vernon		*	Bos-Law-Worcester	NRPC
NRPC	NRPC	Nashua	*	*	Bos-Law-Worcester	NRPC
RPC	Seacoast	New Castle	*	*	Ports-Dover-Roch	Seacoast MPO
SRPC	Seacoast	New Durham		*	Ports-Dover-Roch	Seacoast MPO
RPC	Seacoast	Newfields	*	*	Ports-Dover-Roch	Seacoast MPO
RPC	Seacoast	Newington	*	*	Ports-Dover-Roch	Seacoast MPO
SRPC	Seacoast	Newmarket	*	*	Ports-Dover-Roch	Seacoast MPO
RPC	SPW	Newton	*	*	Bos-Law-Worcester	Seacoast MPO
RPC	Seacoast	North Hampton	*	*	Ports-Dover-Roch	Seacoast MPO
SRPC	Seacoast	Northwood		*	Manchester	Seacoast MPO
SRPC	Seacoast	Nottingham		*	Manchester	Seacoast MPO
NRPC	NRPC	Pelham	*	*	Bos-Law-Worcester	NRPC
RPC	SPW	Plaistow	*	*	Bos-Law-Worcester	Seacoast MPO
RPC	Seacoast	Portsmouth	*	*	Ports-Dover-Roch	Seacoast MPO
SNHPC	SNHPC	Raymond	*	*	Manchester	SNHPC
SRPC	Seacoast	Rochester	*	*	Ports-Dover-Roch	Seacoast MPO
SRPC	Seacoast	Rollinsford	*	*	Ports-Dover-Roch	Seacoast MPO
RPC	Seacoast	Rye	*	*	Ports-Dover-Roch	Seacoast MPO
RPC	SPW	Salem	*	*	Bos-Law-Worcester	Seacoast MPO
RPC	SPW	Sandown	*	*	Bos-Law-Worcester	Seacoast MPO
RPC	Seacoast	Seabrook	*	*	Bos-Law-Worcester	Seacoast MPO
SRPC	Seacoast	Somersworth	*	*	Ports-Dover-Roch	Seacoast MPO
RPC	Seacoast	South Hampton	*	*	Bos-Law-Worcester	Seacoast MPO
SRPC	Seacoast	Strafford		*	Ports-Dover-Roch	Seacoast MPO
RPC	Seacoast	Stratham	*	*	Ports-Dover-Roch	Seacoast MPO
NRPC	NRPC	Wilton		*	Bos-Law-Worcester	NRPC
RPC	SPW	Windham	*	*	Bos-Law-Worcester	Seacoast MPO
SNHPC	SNHPC	Weare		*	Manchester	SNHPC
SNHPC	SNHPC	New Boston		*	Manchester	SNHPC
SNHPC	SNHPC	Deerfield		*	Manchester	SNHPC

Exhibit 11.
Public Comments

The State of New Hampshire

Department of Environmental Services

Thomas S. Burack
Commissioner

December 6, 2006

Mr. William Watson
Administrator
NH Department of Transportation
7 Hazen Drive
Concord, NH 03302-0483

Re: Comments on the Draft Fiscal Year 2007-2010 Conformity Determinations for Transportation Improvement Programs (TIP), Transportation Plans, and Regional Emissions Analysis of Transportation Projects in New Hampshire's Non-attainment Area

Dear Mr. Watson:

The New Hampshire Department of Environmental Services, Air Resources Division (DES) is pleased to submit comments on the draft Statewide TIP, Plans, and Air Quality Analyses (AQA) for the Fiscal Years 2007-2010 TIPs and 2007-2026 Transportation Plans dated November 7, 2006. This letter is divided into a comment section on the DOT portion of the document (the introduction, Exhibits 1 to 11, and Appendix A), and each of the Metropolitan Planning Organization (MPO) portions of the document found in Appendices B, C, and D. While the comments are lengthy, DES does not feel that the impact of any of the noted discrepancies are such that the overall results of the document will be changed. Therefore, DES concurs with the findings of this document, that the Fiscal Year 2007-2010 TIPs and the 2007-2026 Long Range Transportation Plans conform to the State Implementation Plan.

<u>Comments on the DOT Portion of the Document:</u>

As a general comment on all sections, it would be very helpful if the document had page numbers throughout the full document and therefore request the New Hampshire Department of Transportation (DOT) coordinate with the MPOs to provide for consistent numbering throughout the document. Comments on the introductory language were provided to Stephen Dubois at DOT on November 7, 2006 and are not repeated in this formal comment letter. In addition, preliminary comments have recently been provided to each of the MPOs and included most of the comments noted below.

On Page 7 the year 2025 listing in the Carbon Monoxide (CO) Analysis tables for Nashua and Manchester should be corrected to 2026. It is my understanding that the Southern New Hampshire Planning Commission (SNHPC) has also provided a corrected table for Manchester CO emissions.

Exhibit 1 - Total Emissions Tables for each Non-attainment Budget Area - This exhibit should include CO emission tables or be re-titled to indicate it only includes emission tables related to the ozone non-attainment areas.

The Environmental Protection Agency (EPA) has requested that emissions-to-budget comparisons be in tons per day, the unit of the budgets in the State Implementation Plan, rather than in kilograms per day.

It is unclear if Exhibit 4 is intended to include all projects with in each of the four Metropolitan Planning Organization (MPO) TIPs, or if a review of Exhibits 4, 5, and 6 is necessary to obtain a full project listing. In some cases projects listed in Exhibit 5 are included in Exhibit 4, and in other cases they are not. In addition, there are many inconsistencies between construction years shown in the Exhibit 4 project list and the Exhibit 6 project list. In several cases noted below there are inconsistencies between the MPO TIP project lists and the Exhibit 4 list. Because the MPO TIPs do not get packaged with this compiled air quality analysis it would be useful to have a single exhibit that serves as a compilation of all the MPO TIP exempt and non-exempt project lists. In the current format these three exhibits do not fulfill this need and serve to add much confusion to this document.

The inconsistencies between Exhibit 4 and the MPO TIPs are noted primarily under the comments for each MPO TIP and AQA. However, some are unique to Exhibit 4 and are as follows:

> Statewide BET-ISU does not appear to be in any of the MPO TIP project lists and it is not clear if this is an exempt project.
>
> Manchester to Concord 10418Z is listed three times in Exhibit 4, once as Manchester to Concord where it is stated that “parent project = 10418Z”, again under Salem to Manchester, and a third time under Salem to Manchester to Concord. The Southern New Hampshire Planning Commission (SNHPC) TIP only lists this project once, using the approximate wording of the Exhibit 4 Salem/Manchester/Concord listing. It should be clarified whether this project needs to be shown as three separate projects in the SNHPC TIP as it is in Exhibit 4.

In Exhibit 4 there are projects in several towns within the State’s attainment area that are incorrectly listed as non-exempt. These include projects in the following towns:
Bow-Concord
Concord
Franklin to Northfield
Keene-Milford-Swanzey
New Boston
Northfield
Troy
Whitefield

In Exhibit 4 some projects in the Salem-Manchester area are incorrectly listed as "ATT" for attainment area.

Comments on the MPO Portions of the document:

The following three sections contain comments on the content of the individual MPO air quality analyses, and note any inconsistencies between the MPO analyses, their TIPs, and the full document compiled by DOT. In this portion of the review three basic steps were undertaken:

1. the project list in the AQA was compared to the project list in the TIP and visa versa to ensure all projects were properly included in the analyses. There is an inconsistency as to when projects are listed in both the TIP and AQA, with exempt projects sometimes listed in the AQA, but sometimes not listed. As an overall comment, consistent use of project numbers to identify projects would make the comparison of the documents easier.
2. The AQA and TIP project lists were compared to the project list in Exhibit 4. The assumption was that Exhibit 4 is intended to contain all projects from the four MPO TIPs and Plans.
3. The analyses were reviewed to ensure correct emission factors were used and the analyses were conducted properly, and that the emissions results were correctly summarized on Pages 6 and 7, and in Exhibit 1.

The following abbreviations, consistent with the project lists, are used in this discussion: PE is preliminary engineering, ROW is right of way, and C is construction.

Appendix B - Nashua Regional Planning Commission

Preliminary comments on the Nashua Regional Planning Commission's TIP, AQA, and Long Range Plan documents were emailed to Tim Roache on October 27, 2006. These comments are detailed here and some additions have been made.

- NH 101 - Wilton-Milford-Amherst-Bedford (#13692)- listed exempt E-6 in TIP and in the DOT Exhibit 4 project list, but is shown as non-exempt in the AQA and included in the model. In addition, Exhibit 4 does not list a construction component to this project, just PE and ROW.
- Albuquerque Ave (06-26TE) - in TIP, but not in AQA exempt list.
- Merrimack DW Highway ((#13494) - in TIP, but not in AQA exempt list.
- Milford - S. Street Project - #14078 in AQA and 06-28TE in the TIP, but the project descriptions don't match. Is this the same project?
- Nashua - Main St to E. Hollis - 06-30TE is in the TIP, but not in AQA exempt list.
- Nashua Transit Rte 3 - in AQA as off-model, but is not listed in the TIP
- Nashua - Main St. reconstruction Hollis to Orchard - in AQA exempt list, but not listed in the TIP.
- Litchfield Albuquerque Ave #2740 - construction in 2007 in AQA, 2011 in TIP Table 3
- Merrimack Park & Ride (#12259) - Why does this project have a construction year of 2012, but an opening analysis year of 2026?
- Merrimack US 3 - #3279 - construction listed as 2014 in AQA, 2015 in TIP.

- Nashua Broad Street Pkwy - TIP lists 10040A, G, J, H, P, S, T, &M. The AQA lists 10040K, L, N, U, and V which are not in the TIP
- Nashua 1000 space P&R (#13117) - construction is listed as 2008 in AQA, 2007 in TIP and in the DOT's Exhibit 4 project list.
- Nashua Transit (#06-13CM) is listed in Table 3 as being included in the model, but is done as an off-model analysis.
- Nashua Commuter Rail #13875 (02-22CM) - 3 years operating subsidy for commuter rail. Table 3 shows construction in 2008 and an opening analysis year of 2010. In the off model analysis the opening analysis year is 2009. The NRPC TIP does not list a construction year at all. In Exhibit 4 this project is shown as PE in 2008, 9, and 10, but no construction year is specified.
- Nashua Commuter Rail #13514 (00-12CM) and #68000 are not listed in the NRPC TIP. In Exhibit 4 this project is shown with construction in 2008. The AQA lists this as 2007. Project 68000 is not listed in Exhibit 4.
- Nashua #14432 - closed loop signals - E-52 in TIP, but N/E in AQA
- Nashua 06-28CM - intercity bus service is not listed in the TIP (or STIP)
- Nashua #6061 - Nashua exit 3 ramp - not in AQA exempt list
- Nashua Transit operating assistance - not in AQA exempt list
- Nashua Transit - JARC funds is not listed in the TIP
- Milford 101/13 in exempt list - E-10 in AQA, E-6 in TIP. Exhibit 4 lists the project as E-10, but does not show a construction year, just PE and ROW.
- Amherst 101 - #13692 - exempt E-6 in TIP, in non-exempt table in AQA
- Nashua #14432 - closed loop signals - E-52 in TIP, not exempt in AQA

On Page C-7 is the list of projects included in the NRPC traffic model. The following comments/questions apply to this list:

- The Nashua Commuter Rail Project #13514 and #13875 are included in the model with an opening analysis year of 2010. Construction of this project is in 2008. Why is the opening analysis year not 2009? Why is the accompanying project in the project list, #68000, not included in the model? Neither #13514 or #68000 are listed in the TIP.
- Nashua Broad Street Parkway - This indicates that project numbers 10040A, G, H, I, J, K L, M, N, P, S, T, U, and V are all included in the model. The 2007-2016 TIP document does not appear to include 10040K, L, N, U, or V.
- Hudson Intersection Improvements are listed here, but there is not a corresponding project in Table 3 of the AQA.
- Hollis 4-Corners Intersection Improvements are listed here, but there is not a corresponding project in Table 3 of the AQA.
- Circumferential Highway - #10625L,M, N, and U are listed on Table 3 of the AQA, but #10625Q and R are not listed in Table 3 or i the 2007-2016 TIP document.

Page C-8 is the start of the off-model analyses for projects not in the transportation demand model. The following comments apply to this section of the report:

- The NHDOT Inter City Bus Services project - commuter bus service from Exit 6 and 8 to Boston- is not included in the TIP.

- Table 3 indicates that the Hudson Downtown Signal Coordination Project - 06-10CM - is included as an off-model analysis, however no analysis is included.
- The Merrimack 250 space park and ride is included with an analysis for 2026. Table 3 shows a construction date of 2012 that appears to be incorrect.
- Table 3 incorrectly shows the Nashua Transit System project 06-13CM as being included in the model, however an off-model analysis is appropriately included for this project in this section.
- Table 25: 2026 Ozone Analysis - Build incorrectly calculates the VOC impact of the Commuter Rail Stations. The 0.363 VOC benefit from the downtown Nashua station were mistakenly viewed as a disbenefit. The total VOC increase in 2026 from all three stations should be 2.730 kg/day.
- The emission factors for the NH DOT Inter City Bus Service work sheet are incorrectly labeled as kg/day. They should be gram/mile. The factors themselves are correct.
- Incorrect emission factors are used for the City of Nashua Transit project #06-13CM. The emission factors from the 2005 CMAQ application should be updated using the most recent emission factors for the light duty vehicles. MOBILE6.2 emission factors should always be shown to 3 decimal places. The NOx and VOC factors appear to only be slightly incorrect for the light duty vehicle calculation (they should be 0.589 VOC and 0.548 NOx) and result in a NOx reduction from light duty vehicles of 0.320 kg/day in 2009 versus the 0.35 shown. The CO factor is shown as 0.01 gr/mi, but should be 13.875 gr/mi.. The total impacts from this project are:

  CO decrease of 11.604 kg/day in 2010
  NOx increase 1.097 kg/day in 2009
  VOC decrease of 0.197 in 209
- The corrections in this section of the report should be reflected in the tables on Page 6 and contained in Exhibit 1.

Appendix C - Southern New Hampshire Planning Commission

The following comments are related to the Southern NH Planning Commission AQA included in Appendix C, and their TIP and their Regional Transportation Plan. However, a memorandum from Julie Chen to David Preece dated October 11, 2006 indicated that the wrong version of the AQA (July 2006) is contained the DOT document. Therefore, these comments are applicable to the most recent version that I have which is dated October 2006, not to the version in the DOT document. All applicable tables on Page 6 and in Exhibit 1 should be updated with the correct figures from the most recent analysis. Many of the comments contained here were provided informally to Tim White on October 19, 2006.

In reviewing the AQA and TIP the following discrepancies are noted:

- Bedford-Manchester-Londonderry 11512C - The TIP and Exhibit 4 indicate a construction year of 2007, but Table 2 in the AQA provides an opening analysis year of 2017. This seems to be a long construction time line. Is this correct?

- Manchester 13512 - 600 Space Park and Ride - Exhibit 4 shows a construction year of 2016, Table 2 of the AQA shows a construction year of 2018, and the off-model analysis indicates a project opening of 2017. This project should have ozone and CO analyses for 2017.
- Off model analyses are not included for the following projects:
    - Bus terminal at Exit 4
    - Incident management/ITS (10418Z)
    - MTA downtown circulator
    - DOT traffic signal optimization
    - Incident Management/ITS (06-22CM)
    - Electronic Toll Collection

In comparing the project list in the SNHPC TIP to Exhibit 4 the following discrepancies are noted:

- Bedford 11512A and 11512C are listed in the SNHPC TIP. Exhibit 4 also includes 11512D, F, H, I, & J that are not listed in the TIP.
- Bedford 13953 - the TIP shows PE in 2007-2009 with C in 2010. Exhibit 4 has PE in 2007-2010, ROW in 2012 and C in 2014. The AQA correctly shows this project as being constructed in 2014.
- Hooksett 12537A - the TIP shows C in only 2008, but Exhibit 4 indicates C in both 2007 and 2008.
- Manchester to Concord 10418Z is listed three times in Exhibit 4, once as Manchester to Concord where it is stated that "parent project = 10418Z" and again under Salem to Manchester to Concord. The SNHPC TIP only lists this project once, using the approximate wording of the Exhibit 4 Salem/Manchester/Concord listing. It should be clarified whether this project needs to be two separate projects in the TIP as it is in Exhibit 4.
- Salem to Manchester 13933A, B, C, D, E, F, G, H, and I are listed in Exhibit 4 for construction within the TIP years, but are not included in the SNHPC TIP.
- Salem to Manchester 14800 - debt service project for reconstruction and widening - is included in Exhibit 4, but is not included in the SNHPC TIP.
- Statewide Transportation Systems Management and Operations (ITS, CARS-511) is in the SNHPC TIP, but is not in Exhibit 4.
- Statewide 06-27CM is in the SNHPC TIP, but is not listed in Exhibit 4. It is shown in Exhibit 5. It is unclear if Exhibit 5 is intended to be part of the STIP list.

Appendix D - Rockingham Planning Commission (including corrections made in the October 30, 2006 letter to James Moore)
These comments were discussed with David Walker by phone on December 6, 2006.

It would be useful if the Seacoast MPO TIP project list contained a column to indicate whether projects are exempt or non-exempt, similar to the format used for the Salem-Plaistow-Windham TIP project list.

- Dover 14287 - Indian Brook Drive P&R, and Durham 13867 - Main Street - show construction in 2006 in the AQA non-exempt project list. Were these projects implemented in FY2006, or should they be added to the 2007-2010 TIP?
- Exeter 13871 - shows construction in 2006 in AQA, but 2007 in TIP. Because the first analysis year is 2007 this will not impact the AQA, but should be corrected.
- Plaistow-Kingston 10044:
  10044B - TIP shows PE and ROW in 2007-2009, and C in 2010. AQA shows C in 2007-2012. Will the project open in time to be in the 2009 analysis year, or is the 2017 analysis year in the AQA correct?
  10044D - TIP shows C in 2007. AQA shows C in 2006. Why is the opening analysis year 2017? Should it be 2007 or 2009?
  10044E - TIP has C in 2008, AQA in 2006. Why is the opening analysis year 2017? Should it be 2009?
- Plaistow-Haverhill 13515 - Rail Project - AQA shows a construction year of 2006, but in the TIP the project has been moved to 2009.
- Portsmouth 13516 - Woodbury Ave signal coordination. This is listed as construction in 2005 in the AQA, but 2007 in the TIP. It has an opening analysis year of 2017, but should be included in the 2009, and possibly the 2007 analysis.
- Portsmouth 04-16CM - bike/ped path from Michael Succi Drive to the Port Authority - this project lists construction in 2007, but 2017 as the first analysis year. Why is 2009 not the first analysis year?
- Rochester 10620 - segments G and K of this project have construction years that differ between the AQA and the TIP. It does not appear that this impacts the AQA results.
- Rochester 13880 - express bus service - was this project implemented in 2006, or should the implementation date be moved out and this project included in the TIP?
- Salem to Manchester 10418 - I93 widening - segments G and Z are listed for construction in 2007 in the TIP, but are shown as 2005 and 2006 in the AQA. This should not impact the AQA results.
- Salem to Manchester 13933 - In the TIP 13900* is listed as being in the attainment area. This will not impact the AQA as this listing is financial in nature.
  13933L - the TIP shows construction in 2009 and the AQA lists 2011 to 2014. This should not impact the AQA.
  *13933A through K - these projects are broken out by segment in the AQA, but are not listed individually in the TIP. I am not clear on whether or not each segment is required to be listed.
- Seacoast I-95 - Congestion Mitigation project, installation of various ITS devices - this project is listed in the TIP, but not in the AQA project list. Is this the same as project 11151Z for which an off model analysis is provided? Or is this project 14631 in Exhibit 4?
- Seacoast Commuter Options - this project is listed in the TIP, but is not in the AQA project list.
- No Statewide projects are shown in the AQA non-exempt project list, however this list should include Statewide 14354 (04-05CM - Alternative Fuel Vehicle Project) and Statewide 06-27CM (Traffic Signal Optimization).

In comparing the project list in the Seacoast and Salem-Plaistow-Windham(SPW) TIPs to Exhibit 4 the following discrepancies are noted:

- Durham 13868 - UNH Rail Platform - this project is not listed in either Exhibit 4 or 5 of the DOT compiled document.
- Portsmouth 13516 - Woodbury Ave signals - not listed in Exhibit 4.
- Salem to Manchester 14800 - listed in Exhibit 4, but not in the SPW TIP.

Thank you for the opportunity to provide comments. If you have any questions please do not hesitate to contact me at rohler@des.state.nh.us or at 271-6749.

Sincerely,

Rebecca E. Ohler
Air Resources Division
Mobile Source Planning Unit

cc: Don Cooke, EPA Region 1
Leigh Levine, FHWA Concord
Andrew Motter, FTA
Cynthia Copeland, SRPC
Stephen Williams, NRPC
Cliff Sinnott, RPC
David Preece, SNHPC

December 28, 2006

Mr. William Watson, Administrator
NH Department of Transportation
7 Hazen Drive
Concord NH 03302-0483

Re: **Response to comments on the Nashua Regional Planning Commission Portion of the Draft FY 2007-2010Transportation Improvement Program and Air Quality Conformity Determination**

Dear Mr. Watson:

The Nashua Regional Planning Commission (NRPC) completed the review of the New Hampshire Department of Environmental Services, Air Resources Division (DES) comments on the draft 2007-2010 Statewide TIP, 2007-2026 Plan and associated Air Quality Analyses. This attached document contains a response to the questions or comments raised by DES on the NRPC portion of the statewide document.

Where necessary the responses in this document are reflected in the NRPC 2007-2010 TIP and Air Quality Analysis. It is important to note that the response to the majority of the DES comments required administrative corrections and did not impact the Air Quality Analysis or the fiscal constraint of the STIP. Updated copies of 2007-2010 TIP and Air Quality Analyses are attached for your review.

If you have any questions regarding the response to the DES comments or the NRPC TIP or Air Quality Analysis please feel free to contact me at timr@nashuarpc.org or (603) 883-0366 x28.

Sincerely

NASHUA REGIONAL PLANNING COMMISSION

Timothy M. Roache
Principal Transportation Planner

cc: Rebecca Ohler, NHDES

Attachments:

Response to NHDES comments
2007-2010 Transportation Improvement Program
Nashua Metropolitan Area Air Quality Conformity Analysis

Nashua Regional Planning Commission Response to DES Comments
The Nashua Region al Planning Commission portion of the draft TIP, AQA, and Long Range Plan document is contained in Appendix B of the Statewide document.

The DES comments and NRPC responses are detailed below:

- NH 101 - Wilton-Milford-Amherst-Bedford (#13692)- listed exempt E-6 in TIP and in the DOT Exhibit 4 project list, but is shown as non-exempt in the AQA and included in the model. In addition, Exhibit 4 does not list a construction component to this project, just PE and ROW.

  The project is non-exempt. Only the PE and ROW Phases are listed in the TIP and were inadvertently listed as exempt (E-6). The project is not expected to be constructed until after 2017 and is included in the 2026 analysis year. NRPC added the project to the non exempt list in our air quality analysis.

- Albuquerque Ave (06-26TE) - in TIP, but not in AQA exempt list.

  NRPC added the project to the AQA Exempt list.

- Merrimack DW Highway ((#13494) - in TIP, but not in AQA exempt list.

  NRPC added the project to the AQA Exempt list.

- Milford - S. Street Project - #14078 in AQA and 06-28TE in the TIP, but the project descriptions don't match. Is this the same project?

  No, the projects are not the same. Project # 14078 is an exempt project that is simply an upgrade/maintenance of RR crossings at South Street and Union Street in Milford. The South Street project is a recently awarded TE project (06-28TE).

- Nashua - Main St to E. Hollis - 06-30TE is in the TIP, but not in AQA exempt list.

  NRPC added the project to the AQA Exempt list.

- Nashua Transit Rte 3 - in AQA as off-model, but is not listed in the TIP

  This is the intercity bus service project from Exit 6 and Exit 8. Funding for the Nashua Transit Route 3 project was allocated in FY 2007 as part of the 2005-2007 STIP. The project appears in the 2007-2010 NRPC TIP under the Annual listing of obligated projects.

- Nashua - Main St. reconstruction Hollis to Orchard - in AQA exempt list, but not listed in the TIP.

  The project is complete and will be removed from the AQA Exempt List.

- Litchfield Albuquerque Ave #2740 - construction in 2007 in AQA, 2011 in TIP Table 3

  This was an administrative error; NRPC corrected the AQA to read 2011.

- Merrimack Park & Ride (#12259) - Why does this project have a construction year of 2012, but an opening analysis year of 2026?

  The construction year in the current Ten Year Plan is 2014. This project is included as part of the off model analysis for the Extension of Commuter Rail North of Nashua. Credit was only taken

for the 2026 analysis year to correspond with the expected start of rail service. In addition, the Ten Year Plan comments say that construction is depends on implementation of commuter rail service.

- Merrimack US 3 - #3279 - construction listed as 2014 in AQA, 2015 in TIP.

  This was an administrative error; NRPC corrected the AQA to read 2015.

- Nashua Broad Street Pkwy - TIP lists 10040A, G, J, H, P, S, T, &M. The AQA lists 10040K, L, N, U, and V which are not in the TIP

  The numbering of the various project phases in the ten year plan has change with recent updates. These changes will be reflected in the Air Quality Analysis to be consistent with the TIP. In addition phases 10040K and 10040L are programmed for 2012 and 2013 respectively and therefore will not appear in the 2007 -2010 TIP. All phases are expected to be complete by 2017 therefore the opening analysis year is 2017.

- Nashua 1000 space P&R (#13117) - construction is listed as 2008 in AQA, 2007 in TIP and in the DOT's Exhibit 4 project list.

  The construction year in the Air Quality Analysis corrected to be consistent with the TIP.

- Nashua Transit (#06-13CM) is listed in Table 3 as being included in the model, but is done as an off-model analysis.

  This is an off model project. Table 3 has been corrected.

- Nashua Commuter Rail #13875 (02-22CM) - 3 years operating subsidy for commuter rail. Table 3 shows construction in 2008 and an opening analysis year of 2010. In the off model analysis the opening analysis year is 2009. The NRPC TIP does not list a construction year at all. In Exhibit 4 this project is shown as PE in 2008, 9, and 10, but no construction year is specified.

  The opening analysis year was corrected to read 2009 in Table 3. Since the project is simply operating funds all years are categorized as PE not construction.

- Nashua Commuter Rail #13514 (00-12CM) and #68000 are not listed in the NRPC TIP. In Exhibit 4 this project is shown with construction in 2008. The AQA lists this as 2007. Project 68000 is not listed in Exhibit 4.

  Project #68000 was funded through new starts program for PE and Construction. Funding has expired. Therefore the project is not listed in the TIP and has been removed from the Air Quality document.

  Project # 13514 involves the purchase of locomotives and coaches and is listed in the NRPC 2007-2010 TIP on Page 25. Currently the purchase of the equipment is programmed for 2007 and 2008. The opening analysis year is for the project is 2009. No credit was taken for the 2007 analysis year.

- Nashua #14432 - closed loop signals - E-52 in TIP, but N/E in AQA

  Project #14432 is a non exempt project. This was an administrative error in the TIP and will not impact the analysis. The TIP has been corrected.

- Nashua 06-28CM - intercity bus service is not listed in the TIP (or STIP)

  This is the intercity bus service project from Exit 6 and Exit 8. Funding for the Nashua Transit Route 3 project was allocated in FY 2007 as part of the 2005-2007 STIP. The project appears in the 2007-2010 NRPC TIP under the Annual listing of obligated projects

- Nashua #6061 - Nashua exit 3 ramp - not in AQA exempt list

  NRPC added project #6061 to the exempt list.

- Nashua Transit operating assistance - not in AQA exempt list

  NRPC the Nashua Transit operating assistance to the exempt list.

- Nashua Transit - JARC funds is not listed in the TIP

  JARC funds are not listed in the NRPC TIP because Nashua Transit System is not accessing JARC funds at this time. NRPC removed the JARC funding from exempt project list (Table 2) because JARC funding is now a statewide generic pool of funds.

- Milford 101/13 in exempt list - E-10 in AQA, E-6 in TIP. Exhibit 4 lists the project as E-10, but does not show a construction year, just PE and ROW.

  NRPC corrected the exempt code to E-10 in the TIP. The construction is expected to occur later than 2010 therefore the construction phase is not listed on the 2007-2010 TIP.

- Amherst 101 - #13692 - exempt E-6 in TIP, in non-exempt table in AQA

  The project is non-exempt. Only the PE and ROW Phases are listed in the TIP and were inadvertently listed as exempt (E-6). The project is not expected to be constructed until after 2017 and is included in the 2026 analysis year. NRPC added the project to the non exempt list in our air quality analysis.

- Nashua #14432 - closed loop signals - E-52 in TIP, not exempt in AQA

  Project #14432 is a non exempt project. This was an administrative error in the TIP and will not impact the analysis. The TIP has been corrected.

On Page C-7 is the list of projects included in the NRPC traffic model. The following comments/questions apply to this list:

- The Nashua Commuter Rail Project #13514 and #13875 are included in the model with an opening analysis year of 2010. Construction of this project is in 2008. Why is the opening analysis year not 2009? Why is the accompanying project in the project list, #68000, not included in the model? Neither #13514 nor #68000 is listed in the TIP.

  The text on Page C-7 is incorrect. The Nashua Commuter Rail Project #13514 and #13875 are <u>not</u> included in the model. These are off model projects with an analysis year of 2009. The changes are reflected on page C-7 and in Table 3 on page C-4.

  Project #68000 was funded through new starts program for PE and Construction. Funding has expired. Therefore the project is not listed in the TIP and has been removed from the Air Quality document.

  Project # 13514 involves the purchase of locomotives and coaches and is listed in the NRPC 2007-2010 TIP on Page 25.

- Nashua Broad Street Parkway - This indicates that project numbers 10040A, G, H, I, J, K L, M, N, P, S, T, U, and V are all included in the model. The 2007-2016 TIP document does not appear to include 10040K, L, N, U, or V.

  The Text on Page C-7 was corrected to be consistent with the TIP. The numbering of the phases in the ten year plan has change with recent updates. These changes will be reflected on Page C-7. In addition 10040K and 10040L are programmed for 2012 and 2013 respectively and therefore will not appear in the 2007 -2010 TIP

- Hudson Intersection Improvements are listed here, but there is not a corresponding project in Table 3 of the AQA.

  The Hudson Intersection Improvements are added to Table 3 for analysis year 2017

- Hollis 4-Corners Intersection Improvements are listed here, but there is not a corresponding project in Table 3 of the AQA.

  The Hollis 4-Corners Improvements are added to Table 3 for analysis year 2017

- Circumferential Highway - #10625L, M, N, and U are listed on Table 3 of the AQA, but #10625Q and R are not listed in Table 3 or i the 2007-2016 TIP document.

  Project phases 10625Q and R are listed in Table 3. These phases of the project are proposed to be constructed in 2016 and therefore should not be listed in the 2007 – 2010 TIP.

Page C-8 is the start of the off-model analyses for projects not in the transportation demand model. The following comments apply to this section of the report:

- The NHDOT Inter City Bus Services project - commuter bus service from Exit 6 and 8 to Boston- is not included in the TIP.

  This is the intercity bus service project from Exit 6 and Exit 8. Funding for the Nashua Transit Route 3 project was allocated in FY 2007 as part of the 2005-2007 STIP. The project appears in

the 2007-2010 NRPC TIP under the Annual listing of obligated projects.

- Table 3 indicates that the Hudson Downtown Signal Coordination Project - 06-10CM - is included as an off-model analysis, however no analysis is included.

  NRPC inadvertently omitted the off model analysis during the compilation of the conformity document. This is believed to be an administrative error and has been corrected.

- The Merrimack 250 space park and ride is included with an analysis for 2026. Table 3 shows a construction date of 2012 that appears to be incorrect.

  The construction date in the Ten Year Plan is 2014 Table 3 will be corrected to reflect this change. The project is part of the commuter rail extension to Merrimack and was included in the off model analysis for 2026. It is not clear if rail service will be in place by the 2017 analysis year so as a conservative approach NRPC chose not to take credit for the 2017 analysis. In addition, the Ten Year Plan comments say that construction is depends on implementation of commuter rail service.

- Table 3 incorrectly shows the Nashua Transit System project 06-13CM as being included in the model, however an off-model analysis is appropriately included for this project in this section.

  Project 06-13CM is an off model project Table 3 was corrected reflect this.

- Table 25: 2026 Ozone Analysis - Build incorrectly calculates the VOC impact of the Commuter Rail Stations. The 0.363 VOC benefit from the downtown Nashua station were mistakenly viewed as a disbenefit. The total VOC increase in 2026 from all three stations should be 2.730 kg/day.

  NRPC Corrected table 25 to reflect the above comment.

- The emission factors for the NH DOT Inter City Bus Service work sheet are incorrectly labeled as kg/day. They should be gram/mile. The factors themselves are correct.

  NRPC corrected the label on the emission factors to read gram/mile

- Incorrect emission factors are used for the City of Nashua Transit project #06-13CM. The emission factors from the 2005 CMAQ application should be updated using the most recent emission factors for the light duty vehicles. MOBILE6.2 emission factors should always be shown to 3 decimal places. The NOx and VOC factors appear to only be slightly incorrect for the light duty vehicle calculation (they should be 0.589 VOC and 0.548 NOx) and result in a NOx reduction from light duty vehicles of 0.320 kg/day in 2009 versus the 0.35 shown. The CO factor is shown as 0.01 gr/mi, but should be 13.875 gr/mi. The total impacts from this project are:

  CO decrease of 11.604 kg/day in 2010
  NOx increase 1.097 kg/day in 2009
  VOC decrease of 0.197 in 209

  Emission factors have been corrected as shown above. Corresponding analysis results have been updated to reflect changes. NRPC staff worked with DES staff on 12/19/2006 to update analysis.

TR/kmb
#300YY-14

MEMORANDUM

TO: Steve DuBois - NHDOT

FROM: Tim White/Julie Chen - SNHPC

SUBJECT: Responses to Comments on TIP/AQ Analysis/Plan

DATE: December 8, 2006

This memorandum summarizes follow-up information pertaining to NHDES comments on the SNHPC FY 2007 – FY 2010 TIP, Air Quality Analysis and Regional Transportation Plan contained in the December 6, 2006 letter sent to William Watson by Rebecca Ohler. The information contained in this memorandum has been provided based on direction given to SNHPC by NHDOT during a meeting held on December 8, 2006 at the SNHPC offices. The meeting was attended by:

- Steve Dubois, NHDOT
- Leigh Levine, FHWA
- Julie Chen, SNHPC
- Tim White, SNHPC

The remainder of this memorandum contains comments from the December 6, 2006 letter (in italics) followed by the recommended action (bold) required to resolve the comment:

- *Bedford-Manchester-Londonderry 11512C – The* (SNHPC) *TIP and Exhibit 4* (NHDOT Conformity Document) *indicate a construction year of 2007, but Table 2 in the AQA* (Air Quality Analysis) *provides an opening analysis year of 2017. This seems to be a long construction time line. Is this correct?* **Response – All of the construction contracts for the Bedford-Manchester-Londonderry 11512 project as shown in the Air Quality analysis reflect a final completion year of 2011 provided by the NHDOT Project Manager (PM). While the 11512C project has an actual construction year of 2007, we feel that, based on direction received from Rebecca Ohler during our meeting on December 5, 2006, showing the 2011 completion year for 11512 as directed by the PM is an acceptable representation.**

- *Manchester 13512 – 600 Space Park and Ride – Exhibit 4 shows a construction year of 2016, Table 2 of the AQA shows a construction year of 2018, and the off-model analysis indicates a project opening of 2017. This project should have ozone and CO analyses for 2017.* **Response – The SNHPC AQA shows a 2018 <u>completion</u> year for this project, based on information received from the NHDOT PM. The SNHPC TIP (i.e. STIP database) and Exhibit 4 should be updated to reflect this information. The project description should also be modified to**

reflect changes in the management of the project. Based on this information, the SNHPC AQA includes 2026 emissions analyses for this project.

- *Off model analyses are not included for the following projects:*
    - *Bus Terminal at Exit 4*
    - *Incident Management/ITS (10418Z)*
    - *MTA Downtown circulator*
    - *DOT traffic signal optimization*
    - *Incident Management/ITS (06-22CM)*
    - *Electronic Toll Collection*

    Response – Based on direction received from Rebecca Ohler during our meeting on December 5, 2006 and on direction received from Steve DuBois during our December 8, 2006 meeting, Project 06-22CM (ITS) will be included in Project 10418Z (as currently shown in the SNHPC TIP), off-model analyses for the MTA project will be added to the AQA document and information pertaining to the Electronic Toll Collection facilities in Table 2 of the AQA will be modified. It is our understanding that the AQ impacts of the other projects in the list will be addressed by other MPOs and the NHDOT.

- *In comparing the project list in the SNHPC TIP to Exhibit 4 the following discrepancies are noted:*
    - *Bedford 11512A and 11512C are listed in the SNHPC TIP. Exhibit 4 also includes 11512D, F, H, I & J that are not listed in the TIP.* **Response – The comment has been addressed and the TIP has been updated.**

    - *Bedford 13953 – the TIP shows PE in 2007-2009 with C* (Construction) *in 2010. Exhibit 4 has PE* (Preliminary Engineering) *in 2007-2010, ROW* (Right of Way) *in 2012 and C in 2014. The AQA correctly shows this project as being constructed in 2014.* **Response – The SNHPC TIP appears to show PE for this project in 2007 – 2010 corresponding to Exhibit 4. No action appears to be required.**

    - *Hooksett 12537A – the TIP shows C in 2008 only, but Exhibit 4 indicates C in both 2007 and 2008.* **Response - The SNHPC TIP (i.e. STIP database) and Exhibit 4 should be reviewed and should show the same information for this project.**

    - *Manchester to Concord 10418Z is listed 3 times in Exhibit 4, once as Manchester to Concord where it is stated that "parent project = 10418Z" and again under Salem to Manchester to Concord. The*

SNHPC TIP only lists this project once, using the approximate wording of the Exhibit 4 Salem/Manchester/Concord listing. It should be clarified whether this project needs to be two separate projects in the TIP as it is in Exhibit 4. **Response – Based on direction received from Steve DuBois during our December 8, 2006 meeting, Project 06-22CM (ITS) will be included in Project 10418Z (as currently shown in the SNHPC TIP). Additional listings of this project in Exhibit 4 should be removed.**

- *Salem to Manchester 13933A, B, C, D, E, F, G, H, and I are listed in Exhibit 4 for construction within the TIP years, bur are not included in the SNHPC TIP.* **Response - The SNHPC TIP (i.e. STIP database) and Exhibit 4 in the NHDOT Conformity Document should be reviewed and should show the same information.**

- *Salem to Manchester 14800 – debt service project for reconstruction and widening - is included in Exhibit 4, but is not included in the SNHPC TIP.* **Response - The SNHPC TIP (i.e. STIP database) and Exhibit 4 in the NHDOT Conformity Document should be reviewed and should show the same information.**

- *Statewide Transportation Systems Management and Operations (ITS, CARS-511) is in the SNHPC TIP, but is not in Exhibit 4.* **Response - The SNHPC TIP (i.e. STIP database) and Exhibit 4 should be reviewed and should show the same information for this project.**

- *Statewide 06-27CM is in the SNHPC TIP, but is not listed in Exhibit 4. It is shown in Exhibit 5. It is unclear if Exhibit 5 is intended to be part of the STIP list.* **Response - The SNHPC TIP (i.e. STIP database) and Exhibit 4 should be reviewed and should show the same information for this project.**

Please do not hesitate to call if you have questions or if you require further information. I will be sending you additional comments on required revisions to the SNHPC TIP as directed by our member communities and the MTA.

cc: David Preece, SNHPC
Rebecca Ohler, NH DES
Leigh Levine, FHWA

Rockingham
Planning
Commission

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MEMORANDUM

DATE: January 2, 2007

TO: Becky Ohler, NH DES
Bill Watson, NH DOT

FROM: David Walker, Senior Transportation Planner DW

RE: Response to NH DES Comments on Air Quality Conformity Analysis Document

This memo addresses the comments submitted by Becky Ohler of NH Department of Environmental Services Air Quality Division regarding the Air Quality Analysis document submitted by the Seacoast and Salem-Plaistow-Windham MPOs as part of the adoption of the 2007-2010 TIP/STIP. The response to each comment is listed below (shaded and blocked out) and the TIP and Air Quality Documents have been updated accordingly. If you have any questions regarding these changes, please contact me.

Comments and Response:

1. It would be useful if the Seacoast MPO TIP project list contained a column to indicate whether projects are exempt or non-exempt, similar to the format used for the Salem-Plaistow-Windham TIP project list.

   A column indicating the Clean Air Act Code has been added to the Seacoast MPO 2007-2010 Transportation Improvement Program.

2. Dover 14287 - Indian Brook Drive P&R, and Durham 13867 - Main Street – show construction in 2006 in the AQA non-exempt project list. Were these projects implemented in FY2006, or should they be added to the 2007-2010 TIP?

   This project was not completed in FY 2006 and should have been included in the 2007-2010 STIP. Construction is anticipated to be completed during FY 2007

3. Exeter 13871 - shows construction in 2006 in AQA, but 2007 in TIP. Because the first analysis year is 2007 this will not impact the AQA, but should be corrected.

   Construction year changed to 2007 in Air Quality Analysis document "Not-Exempt" table.

Atkinson • Brentwood • Danville • East Kingston • Epping • Exeter • Fremont • Greenland • Hampstead • Hampton • Hampton Falls • Kensington • Kingston • New Castle
Newfields • Newington • Newton • North Hampton • Plaistow • Portsmouth • Rye • Salem • Sandown • Seabrook • South Hampton • Stratham • Windham

4. Plaistow-Kingston 10044:
   - 10044B - TIP shows PE and ROW in 2007-2009, and C in 2010. AQA shows C in 2007-2012. Will the project open in time to be in the 2009 analysis year, or is the 2017 analysis year in the AQA correct?
   - 10044D - TIP shows C in 2007. AQA shows C in 2006. Why is the opening analysis year 2017? Should it be 2007 or 2009?
   - 10044E - TIP has C in 2008, AQA in 2006. Why is the opening analysis year 2017? Should it be 2009?

> The discrepancy in the documentation for project 10044B is a holdover from the previously adopted TIP/Plan Air Quality Analysis. Project 10044B is correctly listed in the Air Quality Analysis as having a 2017 opening year. In the Previous TIP/Long Range Plan, 10044D and 10044E had not been detailed as components of the 10044B project. Construction funds had been programmed for the years between 2007-12 with no detail as to what specific portions of the project construction would occur. The opening year analysis for 10044D and 10044E should be 2009.

5. Plaistow-Haverhill 13515 - Rail Project - AQA shows a construction year of 2006, but in the TIP the project has been moved to 2009.

> The Not-Exempt table of the AQA has been updated to show the opening analysis year for this project as 2009. No benefits are taken for this project at this time.

6. Portsmouth 13516 - Woodbury Ave signal coordination. This is listed as construction in 2005 in the AQA, but 2007 in the TIP. It has an opening analysis year of 2017, but should be included in the 2009, and possibly the 2007 analysis.

> Construction updated to 2007 in the AQA to reflect the information in the TIP. Opening analysis year has been changed to 2009, but no credits for this project are being taken at this time.

7. Portsmouth 04-16CM - bike/ped path from Michael Succi Drive to the Port Authority - this project lists construction in 2007, but 2017 as the first analysis year. Why is 2009 not the first analysis year?

> 2009 should be the first analysis year listed in the AQA. The information has been updated to reflect this. No benefits for this project are being taken at this time.

8. Rochester 10620 - segments G and K of this project have construction years that differ between the AQA and the TIP. It does not appear that this impacts the AQA results.

> The AQA has been updated to match the information in the TIP. The project enters the regional travel demand model in the 2009 analysis year regardless.

9. Rochester 13880 - express bus service - was this project implemented in 2006, or should the implementation date be moved out and this project included in the TIP?

> This project was not implemented in 2006 and should be included in the TIP and AQA for 2007 construction and initial analysis year.

10. Salem to Manchester 10418 - I93 widening - segments G and Z are listed for construction in 2007 in the TIP, but are shown as 2005 and 2006 in the AQA. This should not impact the AQA results.

> AQA Listing for these projects has been updated to reflect information in the TIP.

11. Salem to Manchester 13933 - In the TIP 13900* is listed as being in the attainment area. This will not impact the AQA as this listing is financial in nature.

> Not sure why this was listed as occurring in an attainment area in the TIP/STIP but should be listed as N/E. This is where NH DOT is paying for the Salem-Manchester widening so should be considered as part of that project even if it has no impact on the Air Quality Analysis.

12. 13933L - the TIP shows construction in 2009 and the AQA lists 2011 to 2014. This should not impact the AQA.

> The AQA has been adjusted to be consistent with the TIP. Given the scope of this particular sub-project, I do not expect construction to be complete during 2009 and we have the I-93 widening fully implemented for the 2017 analysis year.

13. *13933A through K - these projects are broken out by segment in the AQA, but are not listed individually in the TIP. I am not clear on whether or not each segment is required to be listed.

> They may not be necessary. It's difficult to keep up with the constant changes in the project numbers for that project. Some of these sub-projects appear in the Ten Year Plan and the MPO Long Range Plan. Sub-projects sometimes disappear during one TIP only to reappear the next. We will keep them in for now.

14. Seacoast I-95 - Congestion Mitigation project, installation of various ITS devices this project is listed in the TIP, but not in the AQA project list. Is this the same as project 11151Z for which an off model analysis is provided? Or is this project 14631 in Exhibit 4?

> After looking at all the documents (TIP, STIP and AQA) and consulting with NH DOT, they are all the same project. I have added project 14631 into the Not-Exempt list as it is Earmarked Federal funding for the I-95 Incident Management System (formerly 11151Z). There is no separate air quality analysis accompanying it as collectively these projects have the same scope as project 11151Z. That project is no longer in the TIP but has

been replaced by 11151E (CMAQ Funded) and 11151F (State Turnpike Funding) and 14631. These changes will be reflected in the AQA as well.

15. Seacoast Commuter Options - this project is listed in the TIP, but is not in the AQA project list.

This project has been added to the Not-Exempt listing. No credit is being taken for this project at this time.

16. No Statewide projects are shown in the AQA non-exempt project list, however this list should include Statewide 14354 (04-05CM - Alternative Fuel Vehicle Project) and Statewide 06-27CM (Traffic Signal Optimization).

Projects 14354 and 06-27CM have been added to the Not-Exempt project list. No credits are being taken for these projects at this time.

17. In comparing the project list in the Seacoast and Salem-Plaistow-Windham(SPW) TIPs to Exhibit 4 the following discrepancies are noted:

- Durham 13868 - UNH Rail Platform - this project is not listed in either Exhibit 4 or 5 of the DOT compiled document.
- Portsmouth 13516 - Woodbury Ave signals - not listed in Exhibit 4.
- Salem to Manchester 14800 - listed in Exhibit 4, but not in the SPW TIP.

The first two projects represent changes that NH DOT needs to make to the Draft AQA. Project 14800 is not listed in the Ten Year Plan or the STIP for 2007-2010. It could be added to the TIP (if necessary) once further information on the project is provided such as cost, schedule, funding source, etc...

Appendix A
Budgets for all analysis years for Seacoast and Southern non-attainment budget regions

The mobile source emission budgets for the Seacoast Serious (Portsmouth-Dover-Rochester nonattainment area) and Southern Serious (NH Portion of the Boston-Lawrence-Worchester nonattainment area) ozone non-attainment areas shown below were submitted to EPA in the 2003 Attainment Demonstration State Implementation Plan by NH DES. The Seacoast 2003 budget was deemed adequate for use in conformity determinations by EPA on August 19, 1998. The 2007 budget for the Southern area was approved by EPA December 6, 2002 (effective date January 6, 2003)

Southern 2007 budgets:

10.72 tons/day VOC	(9,725 kg/day)
21.37 tons/day NOx	(19,386 kg/day)

Seacoast 2003 budgets:

6.97 tons/day VOC	(6,323 kg/day)
13.68 tons/day NOx	(12,410 kg/day)

The carbon monoxide budgets for the Manchester and Nashua CO maintenance areas are 55.83 and 60.13 tons per day respectively. These budgets were submitted to EPA on February 8, 1999 in New Hampshire's redesignation request for these cities. EPA deemed these budgets adequate in a letter dated March 15, 2000.

Appendix B
NRPC Report

Nashua Metropolitan Area
Air Quality Conformity Analysis
2007-2026

8-Hour Rule

NASHUA REGIONAL PLANNING COMMISSION

Updated December 28, 2006

115 Main Street
P.O. Box 847
Nashua, NH 03061
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INTRODUCTION

As mandated by the Clean Air Act Amendments of 1990 (CAAA), the Transportation Equity Act for the 21st Century (TEA 21) and SAFETEA-LU, Transportation Improvement Programs and Long Range Transportation Plans in areas not in attainment with National Ambient Air Quality Standards (NAAQS) must be found to conform to the State Implementation Plan (SIP). The Nashua Regional Planning Commission (NRPC) area, with the exception of Lyndeborough, Mont Vernon and Wilton is part of the Boston-Manchester-Portsmouth (SE) NH Non-Attainment Area for the 8-Hour Ozone Standard. New Hampshire's SIP establishes mobile source emission budgets for ozone precursors [volatile organic compounds (VOCs) and nitrogen oxides (NOx)] in the States serious 1-hour non-attainment areas. Per guidance from the Environmental Protection Agency and the Federal Highway Administration MPOs must use the 1-hour budgets to demonstrate conformity under the new 8-hour standard prior to establishment of new 8-hour budgets. MPOs must also review the air quality analyses from all MPOs that are within the 8-hour non-attainment area (there are four) to determine if the region-wide emissions conform to the SIP. This process is orchestrated by NHDOT. The CAAA requires a demonstration of conformity to these budgets as part of the transportation planning process. A summary of the results of this analysis can be found in Table 20.

In addition to the region being in non-attainment for ground level ozone, the City of Nashua was designated non-attainment for carbon monoxide (CO) standards in the 1980s. The City demonstrated attainment with the standard in the mid-1990s and now must continue to comply with an established maintenance plan. The plan contains a mobile source emission budget for CO and a demonstration of conformity to this budget must be made. A summary of the results of this analysis can be found in Table 21.

The air quality analysis is conducted by using the traffic data and speed outputs of the NRPC traffic model. The NRPC traffic model includes all twelve communities within the planning region and is calibrated to replicate existing traffic conditions. The outputs from the model are inserted into a spreadsheet containing emission factors generated by the New Hampshire Department of Environmental Services using the most recent version of the Environmental Protection Agency's mobile source emissions model which is MOBILE 6.2. Summertime conditions are used for the ozone analysis, when this pollutant reaches its peak generation. For carbon monoxide, wintertime conditions represent the annual peak.

A regional land use growth analysis for the NRPC area has been conducted through 2026. Interim year land use forecasts are based on an interpolation of the 2026 projections. Analysis years for ozone are 2007, 2009, 2017 and 2026. The analysis years for carbon monoxide are 2010, 2017 and 2026. The final analysis year represents the long-range planning horizon for the NRPC Transportation Plan.

The NHDOT will integrate the analysis results from other regions with those from the NRPC area to produce a final finding of air quality conformity for the Boston-Manchester-Portsmouth (SE) NH Non-Attainment Area for the 8-hour Ozone Standard. The analysis will determine whether the critical test of conformity is met for each analysis year.

TABLE 1: Analysis Years

Ozone Non-Attainment Area	Classification	Analysis Year
Southern NH		
Amherst, Brookline, Hollis, Hudson, Litchfield, Merrimack, Milford, Nashua, Pelham	Moderate	2007, 2009, 2017, 2026
CO Non-Attainment Area	Classification	
Nashua	Maintenance	2010, 2017, 2026

PROJECT LISTING FOR AIR QUALITY ANALYSIS

The next step was to determine the list of transportation projects subject to air quality analysis and the projected year in which the projects will come on line. Table 2 lists projects that are exempt from the air quality conformity process. Table 3 lists projects that are not exempt from the air quality conformity process. Exempt and not exempt projects are defined in the following manner:

Exempt - The project falls into one or more of the defined exempt categories shown in Table 29 and is determined to have either little or no impact upon air emissions, or has beneficial air quality impacts.
Not Exempt - The project is determined to have an impact upon air quality. The project must therefore be included in the future build scenario. Not Exempt projects that have received all necessary approvals from State and Federal agencies are included in future baseline scenarios.

TABLE 2: Air Quality Conformity Determination Exempt Project List

Project Number	Community	Route/Facility	Project Description	Exempt Code
None	Amherst	Caldwell Dr.	Reconstruct crossing & signals @ B&M RR	E-8
13488	Hollis	Main St, Ash St, Broad St	Sidewalks	E-33
04-25TE	Hudson	Hudson Center	Relocate Train Depot	E-28
13894	Hudson	NH 102	Construct sidewalks and bike lanes 4,000' between Evergreen and Megan	E-33
13100	Hudson	NH 3A	Construct sidewalks from Birch to Central St	E-33
13743	Hudson	NH 102	West Road/Robinson Rd intersection. Widen for turn lanes, signals, truck lane	E-51
13353	Hudson	Melendy Rd.	Bridge Rehab over First Brk.	E-19
13354	Hudson	County Rd.	Bridge Rehab over Second Brk.	E-19
13337	Hudson-Londonderry	NH 102	Level & 1" overlay from Nh3A-Buttrick Rd. in Londonderry	E-10
06-26 TE	Litchfield	Albuquerque Ave.	Construction of multi use path	E-6
12802	Lyndeborough	Old Temple Rd.	Replace bridges over Stony Brook	E-19
14251	Lyndeborough	Gulf Rd.	Replace Bridges over Stony Brook	E-19
04-36TE	Merrimack	DW Highway	Town Center sidewalk project	E-33
12105	Merrimack	FEE Turnpike	Bridge Rehab over Souhegan River	E-19
13923	Merrimack	McGraw Bridge Rd.	Bridge Replacement over Baboosic Brk	E-51
14091	Merrimack	Bedford Rd.	Bridge Replacement over Baboosic Brk	E-51
13494	Merrimack	DW Highway	Construct 2400' of sidewalk along east side of DW Highway from Frazier Sq to Twin Bridge Park (00-62TE)	E-33
13320	Merrimack-Bedford	US 3	repave/reconstruct from Bedford Rd. north approximately 4.1 miles.	E-10
13964	Merrimack-Nashua	Manchester St.	Bridge replacement over Pennichuck Reservoir	E-19
5303-MP-2	Metro Planning	Nashua	Nashua MPO Transit Planning	E-36

Project Number	Community	Route/Facility	Project Description	Exempt Code
085-MP-2	Metro Planning	Metro Planning		E-36
06-28TE	Milford	South Street	Pedestrian improvements/sidewalks/ beautification	E-33

TABLE 2 (cont.): Air Quality Conformity Determination Exempt Project List

Project Number	Community	Route/Facility	Project Description	Exempt Code
14078	Milford	1. South St. & 2. Union St	Reconstruct RR crossings, approaches & signals @ B&M RR USDOT AAR #884-286C	E-1
None	Milford	NH 101A & NH 13	Improvements @ "Oval" based on ongoing traffic studies	E-10
10136	Milford to Nashua	NH 101A	Roadway improvements from NH 101 to FEE Turnpike (7.5 miles). Construction projects to be determined by corridor study	E-53
None	Nashua	Boire Field	Various capital improvements, runway rehab, etc.	N/A
6061	Nashua	Trpke	Rehab exit 3 NB ramp	E-19
None	Nashua	Transit	Preventative Maintenance	E-21
None	Nashua	Transit	Non-revenue vehicles	E-22
None	Nashua	Transit	Capital equipment	E-24
None	Nashua	Transit	Bus garage	E-31
None	Nashua	Transit	Operating assistance	E-21
13931	Nashua	NH 130	Broad St reconstruction from Coburn Ave to Coliseum Ave.	E-53
14189	Nashua-Merrimack	US 3	Pavement Rehab & safety work from Henri Burque Hwy north to Greeley St	E-10
13931	Nashua	Broad St.	Reconstruct west segment from Turnpike to Hollis line	E-53
06-30TE	Nashua	E. Hollis Street	RR ROW acquisition	E-45
None	Nashua to Concord	Turnpike	Turnpike resurfacing 2005-2007	E-53
14231	Nashua to Concord	Turnpike	Install emergency reference markers from Mass S/L to Exit 14	E-44
12270	Statewide		Remote sensing applications for NH archeology (94-05TE)	E-38
13813	Pelham	Tallant Rd.	Bridge Replacement over Beaver Brook.	E-19
13805	Pelham-Windham	Castlehill Rd.	Bridge replacement over Beaver Brook.	E-19
13906	Wilton	Town Center	Construct sidewalks in Town Center	E-33

TABLE 3: Air Quality Conformity Determination Not Exempt Project List

Opening Analysis Year	Construct FY	Scenario (Baseline Build)	Community	Route/ Facility	Project Description	Included in Model	Project No.
2026	2016	Build	Amherst, Milford Wilton	NH101 Improvements	CONSTRUCTION of Safety improvements on NH101 (upgrade to median divided highway, etc)	Yes	13692
2007	2007	Build	Nashua	Route 3	Inter city bus service Nashua-Boston	Off model	06-28CM
2017	2010	Build	Hudson	Downtown	Signal Coordination	Off model	06-10CM
2017	2016	Build	Hudson	Various Intersections	Intersection improvements resulting in improved LOS	Yes	N/A
2026	2016	Build	Hudson	Circumferential Highway	Construct bridges (5): Old Derry Rd., Barrets Hill Rd., Glover Brook	Yes	10625 Q
2026	2016	Build	Hudson	Circumferential Highway	Construct mainline & ramps: NH 102 to NH 111 and roadway @ NH 111	Yes	10625R
2017	2016	Build	Hollis	Rte 130/Rte 122	4-Corners intersection improvements	Yes	N/A
2017	2011	Build	Litchfield	Albuquerque	Construct 0.3 mile segment from April Dr to NH 3A including intersection @ NH3A	Yes	2740
2017	2015	Build	Litchfield	Albuquerque	Connect Albuquerque Avenue to Hillcrest		3280
2017	2016	Build	Litchfield	Circumferential Highway	NH3A Construct Industrial Dr. off of NH3A	Yes	10625T
2017	2004	na	Litchfield – Hudson	Circumferential Highway	Demo 2 buildings	na	10625 D
2017	2014	Build	Litchfield – Hudson	Circumferential Highway	Construct mainline, ramps, toll booth, NH 3A improvements	Yes	10625 K
2017	2014	Build	Litchfield – Hudson	Circumferential Highway	Construct mainline & ramps from NH 3A to NH 102	Yes	10625P
2017	2014	Build	Litchfield – Nashua	Circumferential Highway	Construct northern river crossing over Merrimack River	Yes	10625 H
2017	2014	Build	Merrimack – Nashua	Circumferential Highway	Construct bridges (4), mainline & ramps over Pennichuck Brook	Yes	10625I
2026	2016	Build	Nashua – Merrimack	Circumferential Highway	Construct mainline, ramps, US 3 roadway improvements & ramps (2)	Yes	10625L
2026	2016	Build	Merrimack – Nashua	Circumferential Highway	Construct for NHCH & FEE Turnpike: Mainline, ramps & bridges (5) @ Exit 9 interchange	Yes	10625 M
2026	201	Build	Merrimack	Circumferential Highway	Construct mainline, US 3 to Exit 9 and bridges (2), widen Fee Tpke.	Yes	10625 N, 10625 U
2026	2014	Build	Merrimack	FEE Turnpike/US 3	Park'n'Ride, 250 spaces — intermodal facility near RR facility	Off-model	12259

TABLE 3 (cont.): Air Quality Conformity Determination Not Exempt Project List

Opening Analysis Year	Construct FY	Scenario Baseline Build)	Community	Route/ Facility	Project Description	Included in Model	Project No.
2017	2015	Build	Merrimack	US3	Capacity improvements to improve traffic flow @ intersections as identified in recent studies by Town of Merr.	Yes	3279
2017	2015	Build	Merrimack-Bedford	FEE Tpke	Widen Tpke. To 3-lane typical b/t Exit 11 to Bedford Toll Plaza	Yes	13761
2017	2014	Build	Nashua	FEE Tpke	New SB off Ramp @ Exit 36 to connect w/Pheasant Lane Mall	Yes	None
2017	2013	Build	Nashua	E. Hollis St.	Reconstruct from Main St. to Hudson T/L to improve capacity	Yes	None
2017	2010	Build	Nashua	NH101A	Widen from Celina Ave. to Amherst St. Mall to 7 lanes	Yes	10136 A
2017	2010	Build	Nashua	Broad Street Parkway	Demolition, construction, landscaping, etc.	Yes	1004 A, G, H, I, - M, N, P, S-T,
2009	2008	Build	Nashua	FEE Turnpike	Construct 1,000-space Park'n'Ride near B&M RR with rail platform. Facility will be used for carpool, vanpool and passenger rail modes.	Off model	13117 98-13CM
2007	2005	Build	Nashua	DW Hwy	Optimization of 20 traffic signals (98-12CM).	Yes	13130
2010	2010	Build	Nashua	Various	Traffic signals, expand closed loop system to include additional 30 intersections	Off model	14432
2009	2009	Build	Nashua	Transit	Extend hours of operation of bus service. Project to be implemented after 2007 analysis year. No A/Q credits taken for 2017 & 2025 b/c project will continue after first 3 years only if warranted by rider ship levels.	Off model	06-13CM
2009	2008	Build	Nashua	Commuter Rail	Commuter rail station off East Spit Brook Road in Nashua	Off model	13117

TABLE 3 (cont.): Air Quality Conformity Determination Not Exempt Project List

Opening Analysis Year	Construct FY	Scenario (Baseline/ Build)	Community	Route/ Facility	Project Description	Included in Model	Project No.
2009	2008	Build	Nashua	Commuter Rail	Purchase commuter rail equipment (00-12CM)	Off model	13514
2009	2008	Build	Nashua	Commuter Rail	Provide 3 year operating support for Lowell to Nashua Commuter rail(02-22CM)	Off model	13875
2017	2012	Build	Nashua-Hudson	Circumferential Highway	Design north segment between NH 111 & FEE Turnpike — Phases 1, 2 & 3	Yes	10644

TRAFFIC MODEL ASSUMPTIONS

The NRPC Transportation Model was updated in 2003 and now uses TRANSCAD software. The TRANSCAD model network is comprised of roadway segments represented in a link file. Many new links have been added to the model network to reflect the improved capability of the new software. In order to remain consistent with the information used to establish the current mobile source budget, only those links that were in the old model were activated for this analysis. Once a new budget has been established for the 8-hour ozone standard the conformity analysis will include all links in the new model.

In conducting the traffic model analysis, speed is a critical element because there is a specific emission factor (measured in grams per vehicle mile) associated with each speed for each emission type. The traffic model assigns an average congested speed* to each link on the transportation network. Each link is then assigned an emission factor** based on that speed. The emission factor is multiplied by the Vehicle Miles Traveled (VMT) *** for each link to determine the total volume of emissions per day**** for that link.

*Congested speed is a model output that represents a peak period condition along the highway link.
**Emission factors are provided by the NH Department of Environmental Services.
***VMT's are calculated by multiplying the link distance by the daily traffic volumes.
****Converted to kilograms per day.

OTHER ASSUMPTIONS

Most of the non-exempt highway projects are analyzed by coding them into the NRPC traffic model. Several, however, are added as off-model adjustments to the air quality analysis spreadsheet. A description of the manner in which projects were analyzed is provided on the following pages.

PROJECTS INCLUDED IN THE NRPC TRAFFIC MODEL:

ANALYSIS YEAR 2007

Daniel Webster Highway Mitigation Project, Nashua (NHDOT #13130) - The road element consists of making optimization improvements to 20 signalized intersections. It was assumed that a 3-mph increase in average vehicle speed would result along Daniel Webster Highway between Graham Drive and the state line and along Spit Brook Road from Daniel Webster Highway to west of Tara Blvd. The assumed speed increase results primarily from the optimization of traffic signals in the area.

ANALYSIS YEAR 2017

Albuquerque Avenue (north segment) (NHDOT project #2740) - Construct 0.3 mile segment from April Drive to NH 3A including intersection at NH 3A.

Albuquerque Avenue (central section) (NHDOT Project #3280) - Missing segment of Albuquerque Ave to be completed. This will connect Albuquerque Avenue to Hillcrest in the central section.

Broad Street Parkway (NHDOT Project #10040) - 2-lane access controlled road connecting West Hollis St to Broad St, providing another east-west connection between downtown Nashua and the Everett Turnpike Includes a connection to the Millyard near the Pine St Extension and an intersection with Franklin St. Also involves reconfiguring Temple, Pearl and Factory Streets to 2-way traffic, and realigning the Hellenic Circle into a typical grid pattern. Model will reflect increased capacity. Speed set at 35 mph.

Circumferential Highway (NHDOT Project #10625) – Construct segment of highway that includes mainline, ramps, toll booth, NH3A improvements. Construct mainline from NH3A to NH102. Construct northern river crossing over Merrimack River from NH 3A to NH 102. Construct bridges (4), mainline and ramps over Pennichuck Brook, construct Industrial Drive off of NH3A. Model will reflect these improvements.

East Hollis Street Reconstruction – Reconstruct from Main Street to Hudson T/L to improve capacity.

F E Everett Turnpike Widening (NHDOT Project # 13761) - FEE Turnpike to be widened to 3 lanes in either direction between Exits 8 and 11. Model will reflect increased capacity.

Hudson Intersection Improvements - Speeds approaching these intersections in Hudson will be increased to portray improved flow:

- Greeley St / Kimball Hill Rd / NH 111
- Chase St / NH 111
- Lowell Rd / County Rd
- County Rd / Belknap Rd

Merrimack/US3 – Capacity improvements to improve traffic flow. Model will reflect increased capacity.

US3-Exit 36 - Addition of southbound off-ramp to Exit 36 just across the Massachusetts state line to provide southbound access from the Everett Turnpike to the Pheasant Lane Mall. Model will reflect new interchange and capacity.

Hollis 4-Corners Intersection Improvements - Addition of turn lanes at the signalized intersection of NH Route 122 and NH Route 130

NH101A Capacity Improvements (NHDOT Project #10136A) - Segment of NH101A in Nashua from Celina Ave to Somerset Parkway becomes a 7-lane cross-section. Model will reflect increased capacity.

ANALYSIS YEAR 2026

Circumferential Highway (NHDOT Project#10625 Q, R, L, M, N, U) – Construct bridges (5) at Old Derry Road, Barrets Hill Road and Glover Brook. Construct main line ramps at NH102, NH 111 and roadway at NH111. Construct mainline ramps and bridges (5) at Exit 9 interchange.

NH 101 Reconstruction (NHDOT Project #13692) - Widening of NH 101 between west end of bypass and Bedford town line to 4 lane access controlled highway. Also includes new section of bypass (2-lane) to run behind Elm St and end near Wilton-Milford line. Speed set at 55 mph.

OFF-MODEL ADJUSTMENTS:

Commuter Rail Project - Nashua, NH to Lowell, MA (Project # 00-12CM)

This project entails the introduction of commuter rail service in the vicinity of the FEE Turnpike/Daniel Webster Exit 1 interchange (South Nashua) in the year 2009, and downtown Nashua in 2025. The commuter rail system will be extended to the vicinity of the Daniel Webster Highway/F.E.E. Turnpike Exit 12 interchange in Merrimack by the year 2025[1].

1. **Turnpike/Daniel Webster Exit 1 Station -** The distance between the Massachusetts State Line and this station is approximately 1 mile. According to the Major Investment Study (MIS) for the Nashua Passenger Rail Service, approximately 926 daily riders will use the proposed station. Of these, the number of ***diverted*** car trips to the South Nashua station would be 475. Diverted trips are the number of cars no longer traveling to Lowell to use the train. Instead, these cars will be driven to the station stop in Nashua. The number of ***new*** trips to the South Nashua station would be 451. New trips are the number of cars that will no longer travel all the way to Boston. Instead, these cars will be driven to the station stop in Nashua, where the occupants will become 'new' train riders. For both diverted and new trips, the vehicle miles saved per trip are equal to the round trip distance (2 miles) from the proposed South Nashua station location to the New Hampshire/Massachusetts boarder. These vehicles no longer will be driven all the way to the boarder and beyond. The vehicle trips (VMTs) added by commuters traveling to the South Nashua station are accounted for in the NRPC traffic model. The service is scheduled to begin in 2009.

   Calculate vehicle trips saved
   Based on the MBTA growth rates for commuter rail, the expected ridership increase will be approximately 5% per year. This figure is about the same as the ridership growth rate indicated in the Lowell to Nashua Commuter Rail Extension Project Draft Environmental Assessment. To determine the number of vehicle trips saved for each analysis year the following formula was used:

   # of Trips = (1.05^y x 926)
   where 1.05 = 5% growth rate per year
   Y = number of years into future from 2007

[1] Assumptions are taken from Major Investment Study for Nashua Passenger Rail Service, October 1999, NRPC

TABLE 4: Number of Trips to South Nashua Commuter Rail Station

Analysis Year	Formula	# of Trips
2007	Given in MIS	926
2009	(1.05^2 x 926)	1,021
2010	(1.05^3 x 926)	1,072
2017	(1.05^{10} x 926)	1,508
2026	(1.05^{19} x 926)	2,340

Calculate VMT saved

- It is assumed that the VMT saved when commuters in South Nashua drive to the rail station rather than into Massachusetts is 2 miles (round trip).
- Vehicle occupancy is assumed to be 1.2 people per car.

TABLE 5: VMT Saved/South Nashua Commuter Rail Station

Analysis Year	# of Trips	Formula	VMT's Saved
2007	926	(926 / 1.2) x 2	1,543
2009	1,021	(1,021 / 1.2) x 2	1,702
2010	1,072	(1,072 / 1.2) x 2	1,787
2017	1,508	(1,508/ 1.2) x 2	2,514
2026	2,340	(2,340 / 1.2) x 2	3,900

Calculate Emissions Reductions Due to VMT Saved

- It is assumed that these vehicles average 60.7 mph. Emission factors (Freeway-Light Duty Vehicles) provided by NHDES.
- Emissions reduction is calculated using this formula:

  Emissions reduced = (VMT saved x emission factor) / 1000 = kg/ day

TABLE 6: Vehicle Emissions Reduced/South Nashua Commuter Rail Station

			Emission Factor			Car Emissions Reduced		
Analysis Year	Speed	VMT	HC	CO	NOX	HC Kg/day	CO Kg/day	NOX Kg/day
2009	60.7	1,702	.489	na	.573	.832	na	.974
2010	60.7	1,787	na	16.355	na	Na	29.221	na
2017	60.7	2,514	.238	12.889	.231	.598	32.401	.580
2026	60.7	3,900	.165	11.852	.143	.643	46.221	.559

Calculate Train Miles Added Due to Rail to South Nashua station:

- Train miles added in New Hampshire = 8 round trips x 1.6 miles in NH = 12.8 miles
- Locomotive emission factors come from Table 9 of document EPA420-F-97-051.
- The Central Transportation Planning staff of the Boston Metropolitan Planning Organization (www.ctps.org/bostonmpo) uses **3 gallons per mile** for the amount of fuel used by a locomotive pulling a 6-car commuter train.

Calculate Emissions Added by Locomotive:

TABLE 7: Calculate Locomotive Emissions

Locomotive Emission Factors (grams per gallon)	HC Gms/gal	CO Gms/gal	NOX Gms/gal
2009	9.4	n/a	168.3
2010	n/a	27.4	n/a
2017	8.3	27.4	146.5
2026	7.3	27.4	129.0

TABLE 7: Calculate Locomotive Emissions (cont.)

Locomotive Emission 's: grams per train mile (grms/gal x gal/mile)	HC Gm/mile	CO Gm/mile	NOX Gm/mile
2009	28.2	n/a	504.9
2010	n/a	82.2	n/a
2017	24.9	82.2	439.5
2026	21.9	82.2	387.0

To determine the emissions from the locomotive for each analysis year the following formula was used:
(Emissions factor in grams per train mile x 12.8 train miles) / 1,000 = Emissions (kg/day)

TABLE 8: Locomotive Emissions/S. Nashua Station

Year	HC (kg/day)	CO (kg/day)	NOX (kg/day)
2009	.361 kg/day	n/a	6.463 kg/day
2010	n/a	1.052 kg/day	n/a
2017	.319 kg/day	1.052 kg/day	5.626 kg/day
2026	.280 kg/day	1.052 kg/day	4.954 kg/day

TABLE 9: Summary of Calculations at South Nashua Station

	Emissions REDUCED due to reduced vehicle VMT (kg/day)			Emissions ADDED due to train (kg/day)			Net Emissions reductions or increase (+) due to rail project (kg/day)		
YEAR	**HC**	**CO**	**NOX**	**HC**	**CO**	**NOX**	**HC**	**CO**	**NOX**
2009	.832	na	.974	0.361	N/A	6.463	.471	Na	+ 5.488
2010	N/A	29.221	N/A	N/A	1.052	N/A	N/A	28.169	na
2017	.598	32.401	.580	0.319	1.052	5.626	.279	31.349	+ 5.046
2026	.643	46.221	.559	0.280	1.052	4.954	.363	45.169	+ 4.394

2. **NASHUA DOWNTOWN STATION:** The commuter rail line will be extended to downtown Nashua in 2025 (first analysis year will be 2026). The distance between the Massachusetts State Line and Exit 5 on the Everett Turnpike in Nashua is 4.5 miles. It is assumed that there will be 250 riders from the downtown station and that the VMT's saved when commuters no longer travel to the Massachusetts border is 9 miles (round trip). The vehicle trips (VMT's) added by commuters traveling to the downtown station is accounted for in the NRPC traffic model. The distance the train must travel is 7.5 miles (round trip between south Nashua station and downtown station).

Calculate VMT saved:

- It is assumed that 250 passengers will board at the Downtown Nashua station in 2026.
- It is assumed that the VMT saved when commuters in South Nashua drive to the rail station rather than into Massachusetts is 9 miles (round trip).
- Vehicle occupancy is assumed to be 1.2 people per car.

TABLE 10: VMT Saved/Downtown Nashua Commuter Rail Station

Analysis Year	# of Trips	Formula	VMT's Saved
2026	250	(250 / 1.2) x 9	1,875

Calculate Emissions Reductions Due to VMT Saved

- It is assumed that these vehicles average 60.7 mph. Emission factor (Freeway-light duty) provided by NHDES.
- Emissions reduction is calculated using this formula:

  Emissions reduced = (VMT saved x emission factor) / 1000

TABLE 11: Vehicle Emissions Reduced/Downtown Nashua Commuter Rail Station

			Emission Factor			Car Emissions Reduced		
Analysis Year	Speed	VMT	HC	CO	NOX	HC Kg/day	CO Kg/day	NOX Kg/day
2026	60.7	1,875	.165	11.852	.143	.309	22.222	.269

Calculate Emissions Added by Locomotive between South Nashua and Downtown Nashua station:
- Train miles added in New Hampshire = 8 round trips x 7.5 miles in NH = 60 miles.
- Emissions factor from Table 7.
- Formula for calculating emissions = (60 train miles added x emissions) / 1,000

TABLE 12: Locomotive Emissions/Downtown Station 2026

Year	HC (kg/day)	CO (kg/day)	NOX (kg/day)
2026	1.314 kg/day	4.932 kg/day	23.22 kg/day

TABLE 13: Summary of Calculations at Downtown Nashua Station

	Emissions REDUCED due to reduced vehicle VMT (kg/day)			Emissions ADDED due to train (kg/day)			Net Emissions reductions or increase (+) due to rail project (kg/day)		
YEAR	**HC**	**CO**	**NOX**	**HC**	**CO**	**NOX**	**HC**	**CO**	**NOX**
2026	.309	22.222	.269	1.314	4.932	23.22	+1.005	17.290	+22.951

3. **MERRIMACK EXIT 12 STATION -** The distance between the Massachusetts State Line and Exit 12 on the Everett Turnpike in Merrimack is 15 miles. It is assumed that the VMT's saved when commuters in Merrimack travel to the rail station near Exit 12 instead of to the Massachusetts boarder is 30 miles (round trip). It is assumed that there will be 250 riders from the Merrimack station. The distance the train must travel is 17.8 miles (round trip between downtown station and Merrimack station). The vehicle trips (VMT's) added by commuters traveling to the Merrimack station is accounted for in the NRPC traffic model.

Calculate VMT saved:
- It is assumed that 250 passengers will board at the Merrimack station in 2025.
- It is assumed that the VMT saved when commuters drive to the Merrimack station rather than into Massachusetts is 30miles (round trip).
- Vehicle occupancy is assumed to be 1.2 people per car.

TABLE 14: VMT Saved/Merrimack Commuter Rail Station

Analysis Year	# of Trips	Formula	VMT's Saved
2026	250	(250 / 1.2) x 30	6,250

Calculate Emissions Reductions Due to VMT Saved:
- It is assumed that these vehicles average 60.7 mph. Emission factor (Freeway-light duty) provided by NHDES.
- Emissions reduction is calculated using this formula:
  Emissions reduced = (VMT saved x emission factor) / 1000

TABLE 15: Vehicle Emissions Reduced/Merrimack Commuter Rail Station

			Emission Factor			Car Emissions Reduced		
Analysis Year	Speed	VMT	HC	CO	NOX	HC Kg/day	CO Kg/day	NOX Kg/day
2026	60.7	6,250	.165	11.852	.143	1.031	74.074	.896

Calculate Emissions Added by Locomotive between Downtown Nashua and Exit 12 station:

- Train miles added in New Hampshire = 8 round trips x 17.8 miles in NH = 142.4 miles
- Emissions factor from Table 7.
- Formula for calculating emissions = (142.4 train miles added x emissions) / 1,000

TABLE 16: Locomotive Emissions/Merrimack Exit 12 - 2026

Year	HC (kg/day)	CO (kg/day)	NOX (kg/day)
2026	3.119 kg/day	11.705 kg/day	55.109 kg/day

TABLE 17: Summary of Calculations at Merrimack Commuter Rail Station

	Emissions REDUCED due to reduced vehicle VMT (kg/day)			Emissions ADDED due to train (kg/day)			Net Emissions reductions or increase (+) due to rail project (kg/day)		
YEAR	**HC**	**CO**	**NOX**	**HC**	**CO**	**NOX**	**HC**	**CO**	**NOX**
2026	1.031	74.074	.896	3.119	11.705	55.109	+2.088	62.369	+54..213

City of Nashua
Wireless Signal Coordination
(Project # 04-30CM)

Scope of Project: This project will build a traffic management system for the city, interconnecting all 89 traffic signals to a central station, including 30 signals that are currently off line. This would allow the city to expand its closed loop signal network, creating new timing plans for its major corridors with an emphasis on vehicle progression. The city would also look at developing one or more traffic adaptive closed loop systems using advanced video detection. The entire system would be compatible with future ITS technology.

It was assumed that the greatest amount of emissions benefit from this project would result from the inclusion of the 30 intersections that are currently off-line (not coordinated). The assumption is that if these signals were to be coordinated, delay at these intersections would be improved and therefore emissions would be reduced. It was not possible to gather field data from all of those intersections. Instead, link speeds, link distances and traffic volumes in the vicinity of the 30 signalized intersections for the analysis years 2010 and 2017 were obtained from the NRPC traffic model. This data was then used in an off-model calculation.

The off-model calculation assumed a 10% increase in link speeds[2]. The results are as follows:

TABLE 18: Air Quality Benefits from Signal Coordination

	VOC (kg/day)	NOx (kg/day)	CO (kg/day)
2010 w/out signalization	n/a	n/a	2,977.04
2010 with signalization	n/a	n/a	3,002.04
Total 2010:	**n/a**	**n/a**	**+25.00 kg/day**
2017 w/out signalization	65.68	79.26	2,352.89
2017 with signalization	63.96	79.5	2,373.38
Total 2017:	**- 1.72 kg/ day**	**+ 0.24 kg/day**	**+ 20.50 kg/day**

[2] Assumptions are based on CMAQ application CM04-30

NHDOT
Inter City Bus Service 06-28CM

Scope of Project: The NHDOT will initiate commuter bus service from Exit 8 and Exit 6 in Nashua to Boston-South Station and Logan Airport. This project will include the purchase of 4 commuter coaches, provide 9 round trips each weekday, and make capital improvements to the park and ride lot and Welcome Center to provide enhanced security, ticketing facilities and other passenger amenities.

Assumptions and notes:

New busses would meet the Heavy Duty Diesel 2007 emissions certification;
Passenger assumptions are based on ridership of previous service in this location;
Average SOV travel speed = 55mph; Average bus travel speed = 55mph
Busses making nine round trips per day between Nashua Park and Rides and Boston:

- 7 miles from Exit 6-8 area to State Line;
- 39 miles from State line to South Station;
- 4 miles from South Station to Logan Airport;

Busses stored in Concord – deadhead miles = 3 buses each way @ 30 miles = 180 miles per day;
Average SOV occupancy = 1.1;
VMTs added by bus in NH 306;

SOV trips reductions:

Year	2007	2009	2010
Annual bus passenger trips	81,865	131,941	131,941
Daily bus passenger trips	224	361	361
SOV trips	204	328	328
Ave trip length in NH	7	7	7
VMTs removed in NH	1,428	2,296	2,296

Light Duty (Freeway) Emission Factors

	VOC (gms/mile)	NOx (gms/mile)	CO (gms/mile)
2007	0.604	0.695	n/a
2009	0.497	0.559	n/a
2010	n/a	n/a	15.851

Bus (Freeway) Emission Factors

	VOC (gms/mile)	NOx (gms/mile)	CO (gms/mile)
2007	0.341	18.621	n/a
2009	0.272	15.970	n/a
2010	n/a	n/a	2.194

Emissions Reduced/added:

	VOC (kg/day)	NOx (kg/day)	CO (kg/day)
2007 NH Emissions			
Light duty emissions reduced in NH:	.863	.992	n/a
Bus emissions added in NH:	.104	5.698	n/a
Emissions reduced (-)/added (+):	**- .758**	**+ 4.706**	**n/a**

	VOC (kg/day)	NOx (kg/day)	CO (kg/day)
2009 NH Emissions			
Light duty emissions reduced in NH:	1.141	1.283	n/a
Bus emissions added in NH:	.083	4.887	n/a
Emissions reduced (-)/added (+):	**- 1.058**	**+ 3.603**	**n/a**

2010 NH Emissions	VOC (kg/day)	NOx (kg/day)	CO (kg/day)
Light duty emissions reduced in NH:	n/a	n/a	36.394
Bus emissions added in NH:	n/a	n/a	.671
Emissions reduced (-)/added (+):	**n/a**	**n/a**	**- 35.723**

TABLE 19: Air Quality Benefits from Intercity Bus

	VOC (kg/day)	NOx (kg/day)	CO (kg/day)
2007 NH Emissions reduced (-)/added (+)	- .758 kg/day	+ 4.706 kg/day	n/a
2009 NH Emissions reduced(-)/added(+)	- 1.058 kg/day	+ 3.603 kg/day	n/a
2010 NH Emissions reduced(-)/added(+)	n/a	n/a	- 35.723 kg/day

City of Nashua, NH
Nashua Transit System CMAQ Project
(Project # 06-13CM)

The objective of this project is to increase the frequency of service (decrease "headways") on Citybus Routes 2 and 6. This will increase the total vehicle miles (and associated emissions) traveled by bus in the City, but decrease the number of vehicles miles (and associated emissions) traveled in personal vehicles.

The methodology for the calculating air quality benefits is as follows:

- The length of the additional bus routes was to calculate the additional emissions that will result from the additional bus trips.
- The length of single occupancy vehicle trips saved was used to calculate the emissions that will no longer be produced because people will ride the bus and not drive their car.
- The difference between the additional bus emissions and the reduced single occupancy vehicle emissions represents the emissions saved by this project.

SUPPORTING DATA AND CALCULATIONS

Emissions *ADDED* Due to Increased Number of Bus Runs:

Route #'s 2 & 6:	# of runs per day	Average length of route (mi.)	Added weekday fleet miles	Average speed of bus (mph)	Bus emission factors (gr/mile) (GVWR=14,050)**(1)**			Emissions added by additional bus runs (kg/day)		
					VOC	Nox	CO	VOC	Nox	CO
2009	24	14.5	348	14	0.408	4.073	n/a	0.142	1.417	n/a
2010	24	14.5	348	14	n/a	n/a	1.697	n/a	n/a	0.591

Emissions *SUBTRACTED* Due to Reduction in Single Occupancy Vehicle (SOV) Trips:

Route #'s 2 & 6:	# of SOV trips saved per day	Average trip length saved (mi.)	Total SOV miles saved/day	Average speed of SOV	SOV emission factors (gr/mi)**(2)**			Emissions reduced by eliminating SOV trips (kg/day)		
					VOC	Nox	CO	VOC	Nox	CO
2009	119	4.91	584.29	25	0.589	0.548	n/a	0.344	0.320	n/a
2010	179	4.91	878.89	25	n/a	n/a	13.857	n/a	n/a	12.179

Net Impact of Decreased Headways Equals the Difference Between Emissions Added By Increased Bus Trips and Emissions Reduced By Elimination of Single Occupancy Vehicle Trips:

	VOC (kg/day)	Nox (kg/day)	CO (kg/day)
2009	-0.202	1.097	n/a
2010	n/a	n/a	-11.588

*Negative # means that there is an **IMPROVEMENT** in air quality.

Notes:

1 Transit Vehicle is Diesel, GVWR = 14,050, MOBILE model vehicle category = HDDV4

2 Emission factors provided by NHDES August 18, 2005 for use in Round 8 CMAQ Air Quality Analysis. All emission factors are in grams per mile. Last updated 8/24/05 by Becky Ohler.

Town of Hudson, NH
Signal Coordination Project

The purpose of this application is to seek funding for the upgraded hardware and software that will be needed to interconnect two new signals (Chase/Central Streets and Library/Central Streets) with three existing signals in downtown Hudson to form a five intersection closed-loop system.

The methodology for calculating the air quality benefits is as follows:

1. A Level of Service (LOS) analysis was performed by NRPC staff in order to calculate the existing delay at the two intersections that will be signalized/included in the five-intersection closed loop system.

2. It was assumed that signalization/coordination of these two intersections will decrease delay by 10% for each of the analysis years. Decreasing dealy at the intersection reduces idling time thereby improving air quality.

3. Emissions were calculated for AM, Mid-Day, and PM peak hours for the two intersections. The emissions were calculated for "existing" delay and "decreased" delay. The difference in emissions between existing and decreased delay is the improvement in air quality.

4. The results of the calculations for each of the intersections were added together to get the total improvement in air quality.

5. The results of these calculations are summarized below.

EMISSIONS REDUCTIONS FOR ENTIRE PROJECT:

Emissions **reductions** (kg/day)	**2007**	**2009**	**2012**	**2017**	**2026**
VOC (Emissions w/o coord.) minus (w/ coord.)	**0.10**	**0.08**	**0.08**	**0.05**	**0.04**
NOx (Emissions w/o coord.) minus (w/ coord.)	**0.04**	**0.04**	**0.04**	**0.02**	**0.01**

Emission factors provided by NH DES August 18, 2005 for use in Round 8 CMAQ Air Quality Analysis.
All emission factors are in grams per mile.
Last updated 8-24-05 by Becky Ohler

SUMMARY OF AIR QUALITY ANALYSIS RESULTS

Table 20 summarizes the results of the summertime ozone analysis for the NRPC portion of the **Boston/Manchester/Portsmouth (Southeastern NH) Non-Attainment Area for the 8-hour Ozone Standard**. The NHDOT will integrate the analysis results from other regions with those from the NRPC area to produce a final finding of air quality conformity for the non-attainment area. The analysis will determine whether the critical test of conformity is met for each analysis year. That is, whether the build scenario is less than the established emissions budget. Tables 22-25 detail the manner in which the traffic model output is combined with off-model adjustments to produce emissions totals for each analysis year scenario for the NRPC portion of the non-attainment area.

Table 21 summarizes the results of the wintertime carbon monoxide analysis for City of Nashua. Tables 26-28 detail the manner in which the traffic model output is combined with off-model adjustments to produce emissions (carbon monoxide) totals for each analysis year scenario for the City of Nashua.

TABLE 20: NRPC Ozone Analysis Summary

YEAR	SCENARIO	VMT	VOC kg/day (Summer)	NOx kg/day (Summer)
2007	Build	4,712,470	3,225.582	5,879.986
2009	Build	4,843,843	2,751.746	4,853.790
2017	Build	5,469,754	1,584.114	2,099.900
2026	Build	6,292,076	1,323.462	1,329.438

TABLE 21: Carbon Monoxide Analysis Summary - City of Nashua

YEAR	SCENARIO	VMT	CO kg/day (Winter)	CO Budget (kg/day)
2010	Build	1,805,196	26,605.355	54,489
2017	Build	1,956,346	21,229.571	54,489
2026	Build	2,146,235	21,369.822	54,489

TABLE 22: 2007 Ozone Analysis - Build

	VMT	VOC (kg/day) (Summer)	NOx (kg/day) (Summer)
Subtotal: Highway Model	4,713,898	3,226.440	5,875.320
OFF-MODEL ADJUSTMENTS:			
Intercity Bus service	- 1,428	- 0.758	+ 4.706
Hudson Signal Coordination	n/a	-0.100	- 0.040
TOTAL – 2007:	**4,712,470**	**3,225.582**	**5,879.986**

TABLE 23: 2009 Ozone Analysis - Build

	VMT	VOC (kg/day) - Summer	NOx (kg/day) - Summer
Subtotal: Highway Model	4,848,425	2,753.558	4,843.642
OFF-MODEL ADJUSTMENTS:			
Commuter Rail	- 1,702	- 0.471	+ 5.488
Intercity Bus service	- 2,296	- 1.058	+ 3.603
Nashua Transit – Increased hours	- 584	- 0.202	+ 1.097
Hudson Signal Coordination	n/a	- 0.080	- 0.040
TOTAL – 2009:	**4,843,843**	**2,751.746**	**4,853.790**

TABLE 24: 2017 Ozone Analysis - Build

	VMT	VOC (kg/day) (Summer)	NOx (kg/day) (Summer)
Subtotal: Highway Model	5,472,267	1,586.162	2,094.634
OFF-MODEL ADJUSTMENTS:			
Commuter Rail	- 2,513	- .279	+ 5.046
Nashua Signal Coordination (04-30CM)	na	- 1.72	+ 0.240
Hudson Signal Coordination	n/a	- 0.050	- 0.020
TOTAL – 2017:	**5,469,754**	**1,584.114**	**2,099.900**

TABLE 25: 2026 Ozone Analysis - Build

	VMT	VOC (kg/day) (Summer)	NOx (kg/day) (Summer)
Subtotal: Highway Model	6,324,541	1,320.772	1,247.880
OFF-MODEL ADJUSTMENTS:			
Commuter Rail **(3 stations)**	- 32,465	+ 2.730	+ 81.568
Hudson Signal Coordination	n/a	- 0.040	- 0.010
TOTAL — 2026:	**6,292,076**	**1,323.462**	**1,329.438**

TABLE 26: 2010 Carbon Monoxide Analysis/City of Nashua - Build

	VMT	CO kg/day (Winter)
Subtotal: Highway Model	1,809,863	26,655.835
OFF-MODEL ADJUSTMENTS:		
Commuter Rail	- 1,787	- 28.169
Intercity Bus service	- 2,296	- 35.723
Nashua Signal coordination (04-30CM)	n/a	+ 25.00
Nashua Transit – Increased hours	- 584	- 11.588
TOTAL — 2010:	**1,805,196**	**26,605.355**

TABLE 27: 2017 Carbon Monoxide Analysis/City of Nashua – Build

	VMT	CO kg/day (Winter)
Subtotal: Highway Model	1,958,859	21,240.42
OFF-MODEL ADJUSTMENTS:		
Commuter Rail	- 2,513	- 31.349
Nashua Signal coordination (04-30CM)	n/a	+ 20.500
TOTAL — 2017:	**1,956,346**	**21,229.571**

TABLE 28: 2026 Carbon Monoxide Analysis/City of Nashua – Build

	VMT	CO kg/day (Winter)
Subtotal: Highway Model	2,153,700	21,494.65
OFF-MODEL ADJUSTMENTS:		
Commuter Rail	- 7,465	- 124.828
TOTAL — 2026:	**2,146,235**	**21,369.822**

TABLE 29: Air Quality Analysis Exempt Codes/Projects Exempt from Conformity

Safety

E-1 Railroad/highway crossing.
E-2 Hazard elimination program.
E-3 Safer non-Federal-aid system roads.
E-4 Shoulder improvements.
E-5 Increasing sight distance.
E-6 Safety improvement program.
E-7 Traffic control devices and operating assistance other than signalization projects.
E-8 Railroad/highway crossing warning devices.
E-9 Guardrails, median barriers, crash cushions.
E-10 Pavement resurfacing and/or rehabilitation.
E-11 Pavement marking demonstration.
E-12 Emergency relief (23 U.S.C. 125).
E-13 Fencing.
E-14 Skid treatments.
E-15 Safety roadside rest areas.
E-16 Adding medians.

E-17 Truck climbing lanes outside the urbanized area.
E-18 Lighting improvements.
E-19 Widening narrow pavements or reconstructing bridges (no additional travel lanes).
E-20 Emergency truck pullovers.

Mass Transit

E-21 Operating assistance to transit agencies.
E-22 Purchase of support vehicles.
E-23 Rehabilitation of transit vehicles.
E-24 Purchase of office, shop and operating equipment for existing facilities.
E-25 Purchase of operating equipment for vehicles (e.g. radios, fareboxes, lifts, etc.)
E-26 Construction or renovation of power, signal and communications systems.
E-27 Construction of small passenger shelters and information kiosks.
E-28 Reconstruction or renovation of transit buildings and structures.
E-29 Rehabilitation or reconstruction of track structures, track, and track bed in existing right-of-way.
E-30 Purchase of new buses and new rail cars to replace existing vehicles or for minor expansions of the fleet.
E-31 Construction of new bus or rail storage/maintenance facilities.

Air Quality

E-32 Continuation of ride-sharing and van pooling promotion activities at current levels.
E-33 Bicycle and pedestrian facilities.

Other

E-34 Planning and technical studies
E-35 Grants for training and research programs.
E-36 Planning activities conducted pursuant to titles 23 and 49 U.S.C.
E-37 Federal-aid systems revisions.
E-38 Engineering to assess social, economic and environmental effects of the proposed action or alternatives to that action.
E-39 Noise attenuation.

TABLE 29: Air Quality Analysis Exempt Codes Projects Exempt from Conformity (con't)

E-40 Advance land acquisitions (23 CFR part 712 or 23 CFR part 771).
E-41 Acquisition of scenic easements.
E-42 Plantings, landscaping, etc.
E-43 Sign removal.
E-44 Directional and informational signs.
E-45 Transportation enhancement activities (except rehabilitation and operation of historic transportation buildings, structures or facilities).
E-46 Repair of damage caused by natural disasters, civil unrest, or terrorist acts, except projects involving substantial functional, locational or capacity changes.

Projects Exempt from Regional Emissions Analysis

E-51 Intersection channelization projects.
E-52 Intersection signalization projects at individual intersections.
E-53 Intersection reconfiguration projects.
E-54 Changes in vertical and horizontal alignment.
E-55 Truck size and weight inspection stations.

E-56 Bus terminals and transfer points.

Other Exempt Codes

N/E Project is not exempt.

Indicates that an exempt project is expected to have a beneficial air quality impact and is included in the regional emissions analysis.

TABLE 30: Emission Factors for VOC, NOx, and CO

2007 Summer - Freeway - Light Duty Vehicle Composite				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
3	4.309	1.289	Freeway	2007
4	2.928	1.210	Freeway	2007
5	2.099	1.163	Freeway	2007
6	1.696	1.077	Freeway	2007
7	1.482	0.988	Freeway	2007
8	1.323	0.921	Freeway	2007
9	1.198	0.870	Freeway	2007
10	1.098	0.828	Freeway	2007
11	1.025	0.789	Freeway	2007
12	0.976	0.749	Freeway	2007
13	0.933	0.715	Freeway	2007
14	0.898	0.686	Freeway	2007
15	0.866	0.660	Freeway	2007
16	0.840	0.645	Freeway	2007
17	0.820	0.646	Freeway	2007
18	0.803	0.647	Freeway	2007
19	0.787	0.648	Freeway	2007
20	0.772	0.649	Freeway	2007
21	0.760	0.650	Freeway	2007
22	0.749	0.650	Freeway	2007
23	0.740	0.650	Freeway	2007
24	0.732	0.651	Freeway	2007
25	0.724	0.651	Freeway	2007
26	0.716	0.651	Freeway	2007
27	0.709	0.651	Freeway	2007
28	0.703	0.651	Freeway	2007
29	0.697	0.651	Freeway	2007
30	0.691	0.651	Freeway	2007
31	0.685	0.650	Freeway	2007
32	0.679	0.650	Freeway	2007
33	0.674	0.649	Freeway	2007
34	0.668	0.648	Freeway	2007
35	0.664	0.647	Freeway	2007
36	0.660	0.648	Freeway	2007
37	0.656	0.651	Freeway	2007
38	0.652	0.652	Freeway	2007
39	0.649	0.654	Freeway	2007
40	0.646	0.656	Freeway	2007
41	0.643	0.659	Freeway	2007
42	0.640	0.661	Freeway	2007
43	0.637	0.663	Freeway	2007
44	0.634	0.666	Freeway	2007
45	0.631	0.668	Freeway	2007

2007 Summer - Freeway - Light Duty Vehicle Composite				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
46	0.628	0.671	Freeway	2007
47	0.625	0.673	Freeway	2007
48	0.622	0.676	Freeway	2007
49	0.620	0.679	Freeway	2007
50	0.616	0.682	Freeway	2007
51	0.614	0.684	Freeway	2007
52	0.611	0.687	Freeway	2007
53	0.609	0.689	Freeway	2007
54	0.606	0.693	Freeway	2007
55	**0.604**	**0.695**	**Freeway**	**2007**
56	0.602	0.698	Freeway	2007
57	0.600	0.701	Freeway	2007
58	0.598	0.705	Freeway	2007
59	0.597	0.707	Freeway	2007
60	0.595	0.710	Freeway	2007
60.7	0.593	0.712	Freeway	2007

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2007 Summer - Freeway - Bus				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
3	1.465	23.692	Freeway	2007
4	1.385	22.617	Freeway	2007
5	1.336	21.972	Freeway	2007
6	1.264	21.028	Freeway	2007
7	1.193	20.099	Freeway	2007
8	1.139	19.402	Freeway	2007
9	1.097	18.860	Freeway	2007
10	1.064	18.426	Freeway	2007
11	1.025	17.931	Freeway	2007
12	0.975	17.325	Freeway	2007
13	0.934	16.812	Freeway	2007
14	0.898	16.372	Freeway	2007
15	0.867	15.990	Freeway	2007
16	0.836	15.626	Freeway	2007
17	0.802	15.232	Freeway	2007
18	0.770	14.881	Freeway	2007
19	0.743	14.568	Freeway	2007
20	0.718	14.286	Freeway	2007
21	0.694	14.027	Freeway	2007
22	0.668	13.784	Freeway	2007
23	0.645	13.562	Freeway	2007
24	0.624	13.359	Freeway	2007
25	0.605	13.172	Freeway	2007
26	0.586	13.015	Freeway	2007

2007 Summer - Freeway - Bus				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
27	0.567	12.889	Freeway	2007
28	0.550	12.773	Freeway	2007
29	0.534	12.664	Freeway	2007
30	0.519	12.563	Freeway	2007
31	0.505	12.513	Freeway	2007
32	0.491	12.488	Freeway	2007
33	0.479	12.465	Freeway	2007
34	0.467	12.443	Freeway	2007
35	0.455	12.425	Freeway	2007
36	0.445	12.500	Freeway	2007
37	0.435	12.571	Freeway	2007
38	0.425	12.639	Freeway	2007
39	0.416	12.703	Freeway	2007
40	0.408	12.827	Freeway	2007
41	0.401	13.010	Freeway	2007
42	0.393	13.184	Freeway	2007
43	0.387	13.350	Freeway	2007
44	0.380	13.518	Freeway	2007
45	0.375	13.841	Freeway	2007
46	0.370	14.150	Freeway	2007
47	0.365	14.445	Freeway	2007
48	0.360	14.728	Freeway	2007
49	0.356	15.169	Freeway	2007
50	0.353	15.658	Freeway	2007
51	0.349	16.127	Freeway	2007
52	0.346	16.578	Freeway	2007
53	0.344	17.169	Freeway	2007
54	0.342	17.909	Freeway	2007
55	**0.341**	**18.621**	**Freeway**	**2007**
56	0.339	19.308	Freeway	2007
57	0.338	20.126	Freeway	2007
58	0.338	21.230	Freeway	2007
59	0.338	22.296	Freeway	2007
60	0.338	23.327	Freeway	2007
60.7	0.338	24.028	Freeway	2007

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2007 Summer - Freeway - All Vehicle Composite				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
3	4.255	2.083	Freeway	2007
4	2.935	1.977	Freeway	2007
5	2.144	1.914	Freeway	2007
6	1.751	1.805	Freeway	2007
7	1.538	1.694	Freeway	2007
8	1.378	1.611	Freeway	2007
9	1.254	1.546	Freeway	2007
10	1.155	1.494	Freeway	2007
11	1.080	1.443	Freeway	2007
12	1.027	1.387	Freeway	2007
13	0.982	1.340	Freeway	2007
14	0.943	1.300	Freeway	2007
15	0.910	1.265	Freeway	2007
16	0.881	1.240	Freeway	2007
17	0.859	1.230	Freeway	2007
18	0.839	1.221	Freeway	2007
19	0.821	1.213	Freeway	2007
20	0.805	1.206	Freeway	2007
21	0.790	1.199	Freeway	2007
22	0.778	1.193	Freeway	2007
23	0.767	1.187	Freeway	2007
24	0.757	1.182	Freeway	2007
25	0.747	1.177	Freeway	2007
26	0.738	1.173	Freeway	2007
27	0.730	1.170	Freeway	2007
28	0.722	1.167	Freeway	2007
29	0.715	1.164	Freeway	2007
30	0.708	1.162	Freeway	2007
31	0.701	1.160	Freeway	2007
32	0.694	1.159	Freeway	2007
33	0.687	1.158	Freeway	2007
34	0.681	1.157	Freeway	2007
35	0.676	1.157	Freeway	2007
36	0.671	1.161	Freeway	2007
37	0.667	1.166	Freeway	2007
38	0.663	1.170	Freeway	2007
39	0.659	1.174	Freeway	2007
40	0.655	1.180	Freeway	2007
41	0.651	1.189	Freeway	2007
42	0.648	1.197	Freeway	2007
43	0.645	1.205	Freeway	2007
44	0.641	1.213	Freeway	2007
45	0.638	1.226	Freeway	2007
46	0.635	1.239	Freeway	2007

2007 Summer - Freeway - All Vehicle Composite				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
47	0.632	1.251	Freeway	2007
48	0.628	1.262	Freeway	2007
49	0.625	1.279	Freeway	2007
50	0.622	1.297	Freeway	2007
51	0.620	1.315	Freeway	2007
52	0.617	1.332	Freeway	2007
53	0.615	1.353	Freeway	2007
54	0.613	1.379	Freeway	2007
55	0.611	1.404	Freeway	2007
56	0.609	1.428	Freeway	2007
57	0.607	1.457	Freeway	2007
58	0.606	1.494	Freeway	2007
59	0.605	1.530	Freeway	2007
60	0.603	1.565	Freeway	2007
60.7	0.602	1.588	Freeway	2007

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2007 Summer - Arterial - All Vehicle Composite				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
2.5	5.197	2.156	Arterial	2007
3	4.142	2.071	Arterial	2007
4	2.822	1.965	Arterial	2007
5	2.031	1.902	Arterial	2007
6	1.744	1.789	Arterial	2007
7	1.539	1.709	Arterial	2007
8	1.385	1.649	Arterial	2007
9	1.266	1.602	Arterial	2007
10	1.170	1.565	Arterial	2007
11	1.108	1.506	Arterial	2007
12	1.057	1.458	Arterial	2007
13	1.013	1.416	Arterial	2007
14	0.976	1.381	Arterial	2007
15	0.943	1.351	Arterial	2007
16	0.912	1.320	Arterial	2007
17	0.885	1.294	Arterial	2007
18	0.860	1.270	Arterial	2007
19	0.839	1.249	Arterial	2007
20	0.819	1.230	Arterial	2007
21	0.802	1.212	Arterial	2007
22	0.787	1.197	Arterial	2007
23	0.773	1.182	Arterial	2007
24	0.761	1.169	Arterial	2007
25	0.749	1.156	Arterial	2007
26	0.739	1.146	Arterial	2007

2007 Summer - Arterial - All Vehicle Composite				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
27	0.729	1.137	Arterial	2007
28	0.720	1.128	Arterial	2007
29	0.712	1.120	Arterial	2007
30	0.705	1.113	Arterial	2007
31	0.697	1.109	Arterial	2007
32	0.690	1.106	Arterial	2007
33	0.683	1.103	Arterial	2007
34	0.677	1.100	Arterial	2007
35	0.671	1.097	Arterial	2007
36	0.666	1.102	Arterial	2007
37	0.662	1.107	Arterial	2007
38	0.658	1.111	Arterial	2007
39	0.654	1.115	Arterial	2007
40	0.650	1.119	Arterial	2007
41	0.646	1.127	Arterial	2007
42	0.643	1.135	Arterial	2007
43	0.640	1.143	Arterial	2007
44	0.636	1.151	Arterial	2007
45	0.633	1.158	Arterial	2007
46	0.630	1.170	Arterial	2007
47	0.627	1.182	Arterial	2007
48	0.624	1.194	Arterial	2007
49	0.621	1.205	Arterial	2007
50	0.618	1.216	Arterial	2007
51	0.615	1.233	Arterial	2007
52	0.613	1.250	Arterial	2007
53	0.610	1.266	Arterial	2007
54	0.608	1.282	Arterial	2007
55	0.605	1.297	Arterial	2007
56	0.603	1.321	Arterial	2007
57	0.602	1.345	Arterial	2007
58	0.600	1.367	Arterial	2007
59	0.598	1.389	Arterial	2007
60	0.597	1.410	Arterial	2007
61	0.596	1.444	Arterial	2007
62	0.594	1.476	Arterial	2007
63	0.593	1.508	Arterial	2007
64	0.592	1.538	Arterial	2007
65	0.591	1.568	Arterial	2007

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2009 Summer - Freeway - Light Duty Vehicle Composite				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
3	3.398	1.033	Freeway	2009
4	2.317	0.970	Freeway	2009
5	1.669	0.933	Freeway	2009
6	1.353	0.863	Freeway	2009
7	1.184	0.792	Freeway	2009
8	1.058	0.738	Freeway	2009
9	0.961	0.696	Freeway	2009
10	0.882	0.662	Freeway	2009
11	0.825	0.631	Freeway	2009
12	0.785	0.598	Freeway	2009
13	0.752	0.571	Freeway	2009
14	0.723	0.548	Freeway	2009
15	0.698	0.527	Freeway	2009
16	0.677	0.515	Freeway	2009
17	0.662	0.516	Freeway	2009
18	0.648	0.517	Freeway	2009
19	0.636	0.518	Freeway	2009
20	0.625	0.519	Freeway	2009
21	0.615	0.520	Freeway	2009
22	0.607	0.520	Freeway	2009
23	0.600	0.520	Freeway	2009
24	0.593	0.520	Freeway	2009
25	0.586	0.520	Freeway	2009
26	0.581	0.521	Freeway	2009
27	0.576	0.521	Freeway	2009
28	0.570	0.521	Freeway	2009
29	0.566	0.521	Freeway	2009
30	0.561	0.521	Freeway	2009
31	0.557	0.520	Freeway	2009
32	0.553	0.520	Freeway	2009
33	0.548	0.519	Freeway	2009
34	0.544	0.518	Freeway	2009
35	0.540	0.518	Freeway	2009
36	0.537	0.520	Freeway	2009
37	0.534	0.521	Freeway	2009
38	0.532	0.522	Freeway	2009
39	0.530	0.524	Freeway	2009
40	0.527	0.525	Freeway	2009
41	0.525	0.527	Freeway	2009
42	0.522	0.529	Freeway	2009
43	0.520	0.532	Freeway	2009
44	0.518	0.533	Freeway	2009
45	0.516	0.535	Freeway	2009
46	0.514	0.538	Freeway	2009

2009 Summer - Freeway - Light Duty Vehicle Composite				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
47	0.512	0.540	Free way	2009
48	0.509	0.542	Freeway	2009
49	0.508	0.545	Freeway	2009
50	0.505	0.547	Freeway	2009
51	0.503	0.549	Freeway	2009
52	0.502	0.551	Freeway	2009
53	0.500	0.553	Freeway	2009
54	0.498	0.556	Freeway	2009
55	**0.497**	**0.559**	**Freeway**	**2009**
56	0.495	0.561	Freeway	2009
57	0.494	0.563	Freeway	2009
58	0.492	0.566	Freeway	2009
59	0.491	0.568	Freeway	2009
60	0.490	0.571	Freeway	2009
60.7	0.489	0.573	Freeway	2009

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2009 Summer - Freeway - Bus				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
3	1.172	20.324	Freeway	2009
4	1.108	19.401	Freeway	2009
5	1.069	18.847	Freeway	2009
6	1.011	18.037	Freeway	2009
7	0.954	17.239	Freeway	2009
8	0.911	16.640	Freeway	2009
9	0.878	16.175	Freeway	2009
10	0.851	15.802	Freeway	2009
11	0.820	15.378	Freeway	2009
12	0.780	14.857	Freeway	2009
13	0.747	14.416	Freeway	2009
14	0.718	14.038	Freeway	2009
15	0.693	13.711	Freeway	2009
16	0.669	13.398	Freeway	2009
17	0.641	13.059	Freeway	2009
18	0.616	12.759	Freeway	2009
19	0.594	12.490	Freeway	2009
20	0.574	12.247	Freeway	2009
21	0.555	12.025	Freeway	2009
22	0.535	11.816	Freeway	2009
23	0.516	11.626	Freeway	2009
24	0.499	11.451	Freeway	2009
25	0.484	11.291	Freeway	2009
26	0.469	11.156	Freeway	2009
27	0.454	11.048	Freeway	2009

2009 Summer - Freeway - Bus				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
28	0.440	10.948	Freeway	2009
29	0.427	10.855	Freeway	2009
30	0.415	10.767	Freeway	2009
31	0.404	10.725	Freeway	2009
32	0.393	10.704	Freeway	2009
33	0.383	10.684	Freeway	2009
34	0.373	10.665	Freeway	2009
35	0.364	10.649	Freeway	2009
36	0.356	10.714	Freeway	2009
37	0.348	10.775	Freeway	2009
38	0.340	10.833	Freeway	2009
39	0.333	10.888	Freeway	2009
40	0.326	10.995	Freeway	2009
41	0.320	11.152	Freeway	2009
42	0.315	11.301	Freeway	2009
43	0.309	11.444	Freeway	2009
44	0.304	11.588	Freeway	2009
45	0.300	11.865	Freeway	2009
46	0.296	12.130	Freeway	2009
47	0.292	12.384	Freeway	2009
48	0.288	12.627	Freeway	2009
49	0.285	13.006	Freeway	2009
50	0.282	13.425	Freeway	2009
51	0.279	13.828	Freeway	2009
52	0.277	14.215	Freeway	2009
53	0.275	14.723	Freeway	2009
54	0.274	15.358	Freeway	2009
55	**0.272**	**15.970**	**Freeway**	**2009**
56	0.271	16.560	Freeway	2009
57	0.270	17.262	Freeway	2009
58	0.270	18.210	Freeway	2009
59	0.270	19.126	Freeway	2009
60	0.270	20.011	Freeway	2009
60.7	0.270	20.613	Freeway	2009

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2009 Summer - Freeway - All Vehicle Composite				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
3	3.395	1.669	Freeway	2009
4	2.350	1.584	Freeway	2009
5	1.723	1.533	Freeway	2009
6	1.412	1.445	Freeway	2009
7	1.242	1.355	Freeway	2009
8	1.115	1.288	Freeway	2009
9	1.016	1.236	Freeway	2009
10	0.936	1.194	Freeway	2009
11	0.877	1.153	Freeway	2009
12	0.834	1.108	Freeway	2009
13	0.798	1.070	Freeway	2009
14	0.767	1.037	Freeway	2009
15	0.740	1.009	Freeway	2009
16	0.718	0.989	Freeway	2009
17	0.700	0.980	Freeway	2009
18	0.684	0.973	Freeway	2009
19	0.670	0.967	Freeway	2009
20	0.657	0.961	Freeway	2009
21	0.646	0.956	Freeway	2009
22	0.636	0.951	Freeway	2009
23	0.627	0.946	Freeway	2009
24	0.619	0.942	Freeway	2009
25	0.612	0.938	Freeway	2009
26	0.605	0.935	Freeway	2009
27	0.598	0.932	Freeway	2009
28	0.592	0.930	Freeway	2009
29	0.586	0.928	Freeway	2009
30	0.581	0.926	Freeway	2009
31	0.575	0.925	Freeway	2009
32	0.570	0.924	Freeway	2009
33	0.565	0.923	Freeway	2009
34	0.560	0.923	Freeway	2009
35	0.556	0.922	Freeway	2009
36	0.552	0.926	Freeway	2009
37	0.549	0.930	Freeway	2009
38	0.545	0.933	Freeway	2009
39	0.542	0.937	Freeway	2009
40	0.540	0.942	Freeway	2009
41	0.537	0.949	Freeway	2009
42	0.534	0.956	Freeway	2009
43	0.531	0.962	Freeway	2009
44	0.529	0.968	Freeway	2009
45	0.526	0.979	Freeway	2009
46	0.524	0.989	Freeway	2009

2009 Summer - Freeway - All Vehicle Composite				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
47	0.521	0.999	Freeway	2009
48	0.519	1.009	Freeway	2009
49	0.517	1.022	Freeway	2009
50	0.515	1.037	Freeway	2009
51	0.513	1.052	Freeway	2009
52	0.511	1.065	Freeway	2009
53	0.509	1.083	Freeway	2009
54	0.508	1.104	Freeway	2009
55	0.506	1.125	Freeway	2009
56	0.505	1.144	Freeway	2009
57	0.504	1.167	Freeway	2009
58	0.503	1.198	Freeway	2009
59	0.502	1.227	Freeway	2009
60	0.502	1.255	Freeway	2009
60.7	0.501	1.275	Freeway	2009

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2009 Summer - Arterial - All Vehicle Composite				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
2.5	4.142	1.735	Arterial	2009
3	3.306	1.667	Arterial	2009
4	2.261	1.582	Arterial	2009
5	1.634	1.531	Arterial	2009
6	1.407	1.440	Arterial	2009
7	1.244	1.375	Arterial	2009
8	1.122	1.327	Arterial	2009
9	1.027	1.289	Arterial	2009
10	0.951	1.259	Arterial	2009
11	0.902	1.211	Arterial	2009
12	0.860	1.172	Arterial	2009
13	0.826	1.139	Arterial	2009
14	0.796	1.110	Arterial	2009
15	0.770	1.086	Arterial	2009
16	0.745	1.061	Arterial	2009
17	0.723	1.040	Arterial	2009
18	0.703	1.021	Arterial	2009
19	0.686	1.004	Arterial	2009
20	0.670	0.988	Arterial	2009
21	0.657	0.974	Arterial	2009
22	0.645	0.961	Arterial	2009
23	0.634	0.950	Arterial	2009
24	0.624	0.939	Arterial	2009
25	0.614	0.929	Arterial	2009

2009 Summer - Arterial - All Vehicle Composite				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
26	0.606	0.921	Arterial	2009
27	0.598	0.913	Arterial	2009
28	0.591	0.906	Arterial	2009
29	0.585	0.900	Arterial	2009
30	0.579	0.894	Arterial	2009
31	0.573	0.891	Arterial	2009
32	0.567	0.888	Arterial	2009
33	0.562	0.886	Arterial	2009
34	0.557	0.884	Arterial	2009
35	0.552	0.882	Arterial	2009
36	0.548	0.885	Arterial	2009
37	0.545	0.889	Arterial	2009
38	0.542	0.893	Arterial	2009
39	0.539	0.896	Arterial	2009
40	0.536	0.899	Arterial	2009
41	0.533	0.906	Arterial	2009
42	0.530	0.913	Arterial	2009
43	0.528	0.919	Arterial	2009
44	0.525	0.925	Arterial	2009
45	0.523	0.931	Arterial	2009
46	0.521	0.941	Arterial	2009
47	0.518	0.951	Arterial	2009
48	0.516	0.961	Arterial	2009
49	0.514	0.970	Arterial	2009
50	0.511	0.978	Arterial	2009
51	0.509	0.993	Arterial	2009
52	0.507	1.006	Arterial	2009
53	0.505	1.020	Arterial	2009
54	0.503	1.033	Arterial	2009
55	0.502	1.045	Arterial	2009
56	0.500	1.065	Arterial	2009
57	0.499	1.084	Arterial	2009
58	0.498	1.102	Arterial	2009
59	0.497	1.120	Arterial	2009
60	0.496	1.137	Arterial	2009
61	0.495	1.164	Arterial	2009
62	0.495	1.191	Arterial	2009
63	0.494	1.217	Arterial	2009
64	0.493	1.242	Arterial	2009
65	0.492	1.266	Arterial	2009

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2010 Winter CO - Freeway Light Duty Composite			
Veh Speed	CO	Road Type	Year
3	27.184	Freeway	2010
4	23.238	Freeway	2010
5	20.874	Freeway	2010
6	19.267	Freeway	2010
7	18.095	Freeway	2010
8	17.220	Freeway	2010
9	16.544	Freeway	2010
10	15.998	Freeway	2010
11	15.578	Freeway	2010
12	15.273	Freeway	2010
13	15.013	Freeway	2010
14	14.793	Freeway	2010
15	14.598	Freeway	2010
16	14.468	Freeway	2010
17	14.418	Freeway	2010
18	14.378	Freeway	2010
19	14.343	Freeway	2010
20	14.308	Freeway	2010
21	14.273	Freeway	2010
22	14.253	Freeway	2010
23	14.223	Freeway	2010
24	14.203	Freeway	2010
25	14.183	Freeway	2010
26	14.163	Freeway	2010
27	14.143	Freeway	2010
28	14.127	Freeway	2010
29	14.107	Freeway	2010
30	14.097	Freeway	2010
31	14.107	Freeway	2010
32	14.117	Freeway	2010
33	14.137	Freeway	2010
34	14.152	Freeway	2010
35	14.172	Freeway	2010
36	14.257	Freeway	2010
37	14.342	Freeway	2010
38	14.417	Freeway	2010
39	14.497	Freeway	2010
40	14.577	Freeway	2010
41	14.662	Freeway	2010
42	14.747	Freeway	2010
43	14.827	Freeway	2010
44	14.902	Freeway	2010
45	14.992	Freeway	2010

2010 Winter CO - Freeway Light Duty Composite			
Veh Speed	CO	Road Type	Year
46	15.082	Freeway	2010
47	15.162	Freeway	2010
48	15.241	Freeway	2010
49	15.331	Freeway	2010
50	15.421	Freeway	2010
51	15.506	Freeway	2010
52	15.586	Freeway	2010
53	15.671	Freeway	2010
54	15.761	Freeway	2010
55	**15.851**	**Freeway**	**2010**
56	15.936	Freeway	2010
57	16.026	Freeway	2010
58	16.121	Freeway	2010
59	16.211	Freeway	2010
60	16.295	Freeway	2010
60.7	16.355	Freeway	2010

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2010 Winter CO - Freeway Bus			
Veh Speed	CO	Road Type	Year
3	12.116	Freeway	2010
4	11.086	Freeway	2010
5	10.468	Freeway	2010
6	9.628	Freeway	2010
7	8.816	Freeway	2010
8	8.207	Freeway	2010
9	7.733	Freeway	2010
10	7.354	Freeway	2010
11	6.944	Freeway	2010
12	6.465	Freeway	2010
13	6.059	Freeway	2010
14	5.712	Freeway	2010
15	5.410	Freeway	2010
16	5.127	Freeway	2010
17	4.832	Freeway	2010
18	4.569	Freeway	2010
19	4.335	Freeway	2010
20	4.123	Freeway	2010
21	3.928	Freeway	2010
22	3.740	Freeway	2010
23	3.569	Freeway	2010
24	3.413	Freeway	2010
25	3.268	Freeway	2010

2010 Winter CO - Freeway Bus			
Veh Speed	CO	Road Type	Year
26	3.136	Freeway	2010
27	3.016	Freeway	2010
28	2.904	Freeway	2010
29	2.800	Freeway	2010
30	2.702	Freeway	2010
31	2.618	Freeway	2010
32	2.541	Freeway	2010
33	2.469	Freeway	2010
34	2.401	Freeway	2010
35	2.337	Freeway	2010
36	2.288	Freeway	2010
37	2.242	Freeway	2010
38	2.198	Freeway	2010
39	2.157	Freeway	2010
40	2.124	Freeway	2010
41	2.100	Freeway	2010
42	2.077	Freeway	2010
43	2.055	Freeway	2010
44	2.035	Freeway	2010
45	2.032	Freeway	2010
46	2.029	Freeway	2010
47	2.025	Freeway	2010
48	2.022	Freeway	2010
49	2.034	Freeway	2010
50	2.051	Freeway	2010
51	2.068	Freeway	2010
52	2.084	Freeway	2010
53	2.112	Freeway	2010
54	2.154	Freeway	2010
55	**2.194**	**Freeway**	**2010**
56	2.232	Freeway	2010
57	2.282	Freeway	2010
58	2.354	Freeway	2010
59	2.425	Freeway	2010
60	2.493	Freeway	2010
60.7	2.539	Freeway	2010

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2010 Winter CO - Freeway All Vehicle Composite			
Veh Speed	CO	Road Type	Year
3	27.043	Freeway	2010
4	23.157	Freeway	2010
5	20.825	Freeway	2010
6	19.179	Freeway	2010
7	17.959	Freeway	2010
8	17.044	Freeway	2010
9	16.333	Freeway	2010
10	15.763	Freeway	2010
11	15.314	Freeway	2010
12	14.963	Freeway	2010
13	14.666	Freeway	2010
14	14.411	Freeway	2010
15	14.191	Freeway	2010
16	14.025	Freeway	2010
17	13.943	Freeway	2010
18	13.871	Freeway	2010
19	13.805	Freeway	2010
20	13.747	Freeway	2010
21	13.694	Freeway	2010
22	13.644	Freeway	2010
23	13.600	Freeway	2010
24	13.558	Freeway	2010
25	13.521	Freeway	2010
26	13.486	Freeway	2010
27	13.454	Freeway	2010
28	13.425	Freeway	2010
29	13.397	Freeway	2010
30	13.372	Freeway	2010
31	13.369	Freeway	2010
32	13.376	Freeway	2010
33	13.383	Freeway	2010
34	13.389	Freeway	2010
35	13.397	Freeway	2010
36	13.474	Freeway	2010
37	13.546	Freeway	2010
38	13.615	Freeway	2010
39	13.680	Freeway	2010
40	13.752	Freeway	2010
41	13.831	Freeway	2010
42	13.906	Freeway	2010
43	13.978	Freeway	2010
44	14.047	Freeway	2010
45	14.132	Freeway	2010

2010 Winter CO - Freeway All Vehicle Composite			
Veh Speed	CO	Road Type	Year
46	14.213	Freeway	2010
47	14.290	Freeway	2010
48	14.365	Freeway	2010
49	14.450	Freeway	2010
50	14.537	Freeway	2010
51	14.620	Freeway	2010
52	14.700	Freeway	2010
53	14.790	Freeway	2010
54	14.889	Freeway	2010
55	14.985	Freeway	2010
56	15.077	Freeway	2010
57	15.173	Freeway	2010
58	15.280	Freeway	2010
59	15.383	Freeway	2010
60	15.482	Freeway	2010
60.7	15.550	Freeway	2010

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2010 Winter CO - Arterial - All Vehicle Composite			
Veh Speed	CO	Road Type	Year
2.5	29.784	Arterial	2010
3	26.675	Arterial	2010
4	22.788	Arterial	2010
5	20.456	Arterial	2010
6	18.926	Arterial	2010
7	17.833	Arterial	2010
8	17.013	Arterial	2010
9	16.376	Arterial	2010
10	15.866	Arterial	2010
11	15.467	Arterial	2010
12	15.136	Arterial	2010
13	14.855	Arterial	2010
14	14.614	Arterial	2010
15	14.406	Arterial	2010
16	14.217	Arterial	2010
17	14.050	Arterial	2010
18	13.901	Arterial	2010
19	13.769	Arterial	2010
20	13.649	Arterial	2010
21	13.548	Arterial	2010
22	13.457	Arterial	2010
23	13.373	Arterial	2010
24	13.297	Arterial	2010

2010 Winter CO - Arterial - All Vehicle Composite			
Veh Speed	CO	Road Type	Year
25	13.226	Arterial	2010
26	13.185	Arterial	2010
27	13.147	Arterial	2010
28	13.111	Arterial	2010
29	13.078	Arterial	2010
30	13.047	Arterial	2010
31	13.053	Arterial	2010
32	13.059	Arterial	2010
33	13.064	Arterial	2010
34	13.069	Arterial	2010
35	13.074	Arterial	2010
36	13.150	Arterial	2010
37	13.223	Arterial	2010
38	13.291	Arterial	2010
39	13.357	Arterial	2010
40	13.418	Arterial	2010
41	13.497	Arterial	2010
42	13.572	Arterial	2010
43	13.644	Arterial	2010
44	13.712	Arterial	2010
45	13.778	Arterial	2010
46	13.859	Arterial	2010
47	13.936	Arterial	2010
48	14.011	Arterial	2010
49	14.082	Arterial	2010
50	14.150	Arterial	2010
51	14.234	Arterial	2010
52	14.314	Arterial	2010
53	14.391	Arterial	2010
54	14.466	Arterial	2010
55	14.537	Arterial	2010
56	14.630	Arterial	2010
57	14.719	Arterial	2010
58	14.804	Arterial	2010
59	14.887	Arterial	2010
60	14.968	Arterial	2010
61	15.064	Arterial	2010
62	15.157	Arterial	2010
63	15.248	Arterial	2010
64	15.335	Arterial	2010
65	15.420	Arterial	2010

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2017 Summer - Freeway - Light Duty Vehicle Composite				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
3	1.556	0.417	Freeway	2017
4	1.070	0.391	Freeway	2017
5	0.778	0.377	Freeway	2017
6	0.635	0.348	Freeway	2017
7	0.556	0.318	Freeway	2017
8	0.499	0.295	Freeway	2017
9	0.453	0.278	Freeway	2017
10	0.417	0.264	Freeway	2017
11	0.390	0.251	Freeway	2017
12	0.371	0.238	Freeway	2017
13	0.355	0.226	Freeway	2017
14	0.341	0.216	Freeway	2017
15	0.329	0.208	Freeway	2017
16	0.319	0.203	Freeway	2017
17	0.311	0.203	Freeway	2017
18	0.304	0.204	Freeway	2017
19	0.298	0.204	Freeway	2017
20	0.292	0.205	Freeway	2017
21	0.288	0.205	Freeway	2017
22	0.284	0.205	Freeway	2017
23	0.281	0.206	Freeway	2017
24	0.278	0.206	Freeway	2017
25	0.275	0.206	Freeway	2017
26	0.273	0.206	Freeway	2017
27	0.270	0.206	Freeway	2017
28	0.267	0.206	Freeway	2017
29	0.265	0.207	Freeway	2017
30	0.263	0.207	Freeway	2017
31	0.262	0.207	Freeway	2017
32	0.260	0.206	Freeway	2017
33	0.258	0.206	Freeway	2017
34	0.256	0.205	Freeway	2017
35	0.255	0.205	Freeway	2017
36	0.253	0.206	Freeway	2017
37	0.252	0.207	Freeway	2017
38	0.251	0.208	Freeway	2017
39	0.250	0.208	Freeway	2017
40	0.249	0.209	Freeway	2017
41	0.248	0.210	Freeway	2017
42	0.247	0.211	Freeway	2017
43	0.246	0.212	Freeway	2017
44	0.245	0.213	Freeway	2017
45	0.245	0.214	Freeway	2017

2017 Summer - Freeway - Light Duty Vehicle Composite				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
46	0.244	0.215	Freeway	2017
47	0.244	0.216	Freeway	2017
48	0.243	0.217	Freeway	2017
49	0.242	0.218	Freeway	2017
50	0.241	0.219	Freeway	2017
51	0.241	0.220	Freeway	2017
52	0.240	0.221	Freeway	2017
53	0.240	0.222	Freeway	2017
54	0.239	0.223	Freeway	2017
55	0.239	0.225	Freeway	2017
56	0.239	0.226	Freeway	2017
57	0.239	0.226	Freeway	2017
58	0.238	0.227	Freeway	2017
59	0.238	0.229	Freeway	2017
60	0.238	0.230	Freeway	2017
60.7	0.238	0.231	Freeway	2017

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2017 Summer - Freeway - Bus				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
3	0.720	7.978	Freeway	2017
4	0.681	7.614	Freeway	2017
5	0.657	7.395	Freeway	2017
6	0.621	7.076	Freeway	2017
7	0.586	6.761	Freeway	2017
8	0.560	6.525	Freeway	2017
9	0.539	6.341	Freeway	2017
10	0.523	6.194	Freeway	2017
11	0.504	6.026	Freeway	2017
12	0.479	5.821	Freeway	2017
13	0.459	5.647	Freeway	2017
14	0.441	5.498	Freeway	2017
15	0.426	5.369	Freeway	2017
16	0.411	5.246	Freeway	2017
17	0.394	5.112	Freeway	2017
18	0.379	4.993	Freeway	2017
19	0.365	4.887	Freeway	2017
20	0.353	4.792	Freeway	2017
21	0.341	4.704	Freeway	2017
22	0.329	4.622	Freeway	2017
23	0.317	4.547	Freeway	2017
24	0.307	4.478	Freeway	2017
25	0.297	4.414	Freeway	2017

2017 Summer - Freeway - Bus				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
26	0.288	4.361	Freeway	2017
27	0.279	4.319	Freeway	2017
28	0.271	4.279	Freeway	2017
29	0.263	4.242	Freeway	2017
30	0.255	4.208	Freeway	2017
31	0.248	4.191	Freeway	2017
32	0.242	4.183	Freeway	2017
33	0.235	4.175	Freeway	2017
34	0.229	4.167	Freeway	2017
35	0.224	4.161	Freeway	2017
36	0.219	4.187	Freeway	2017
37	0.214	4.211	Freeway	2017
38	0.209	4.234	Freeway	2017
39	0.205	4.255	Freeway	2017
40	0.201	4.298	Freeway	2017
41	0.197	4.360	Freeway	2017
42	0.193	4.419	Freeway	2017
43	0.190	4.475	Freeway	2017
44	0.187	4.532	Freeway	2017
45	0.184	4.641	Freeway	2017
46	0.182	4.746	Freeway	2017
47	0.179	4.846	Freeway	2017
48	0.177	4.942	Freeway	2017
49	0.175	5.091	Freeway	2017
50	0.173	5.256	Freeway	2017
51	0.172	5.415	Freeway	2017
52	0.170	5.568	Freeway	2017
53	0.169	5.768	Freeway	2017
54	0.168	6.019	Freeway	2017
55	0.167	6.260	Freeway	2017
56	0.167	6.493	Freeway	2017
57	0.166	6.770	Freeway	2017
58	0.166	7.144	Freeway	2017
59	0.166	7.505	Freeway	2017
60	0.166	7.854	Freeway	2017
60.7	0.166	8.092	Freeway	2017

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2017 Summer - Freeway - All Vehicle Composite				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
3	1.615	0.643	Freeway	2017
4	1.136	0.610	Freeway	2017
5	0.848	0.590	Freeway	2017
6	0.702	0.555	Freeway	2017
7	0.621	0.518	Freeway	2017
8	0.559	0.491	Freeway	2017
9	0.512	0.470	Freeway	2017
10	0.473	0.453	Freeway	2017
11	0.444	0.436	Freeway	2017
12	0.422	0.418	Freeway	2017
13	0.404	0.403	Freeway	2017
14	0.388	0.390	Freeway	2017
15	0.374	0.379	Freeway	2017
16	0.362	0.371	Freeway	2017
17	0.353	0.369	Freeway	2017
18	0.344	0.367	Freeway	2017
19	0.337	0.365	Freeway	2017
20	0.330	0.363	Freeway	2017
21	0.324	0.362	Freeway	2017
22	0.319	0.361	Freeway	2017
23	0.315	0.359	Freeway	2017
24	0.311	0.358	Freeway	2017
25	0.307	0.357	Freeway	2017
26	0.303	0.356	Freeway	2017
27	0.300	0.355	Freeway	2017
28	0.297	0.355	Freeway	2017
29	0.294	0.354	Freeway	2017
30	0.291	0.354	Freeway	2017
31	0.288	0.353	Freeway	2017
32	0.286	0.353	Freeway	2017
33	0.283	0.353	Freeway	2017
34	0.281	0.353	Freeway	2017
35	0.279	0.353	Freeway	2017
36	0.277	0.354	Freeway	2017
37	0.276	0.356	Freeway	2017
38	0.274	0.357	Freeway	2017
39	0.273	0.358	Freeway	2017
40	0.271	0.360	Freeway	2017
41	0.270	0.363	Freeway	2017
42	0.269	0.366	Freeway	2017
43	0.268	0.368	Freeway	2017
44	0.267	0.370	Freeway	2017
45	0.265	0.374	Freeway	2017

2017 Summer - Freeway - All Vehicle Composite				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
46	0.264	0.378	Freeway	2017
47	0.263	0.382	Freeway	2017
48	0.263	0.385	Freeway	2017
49	0.262	0.390	Freeway	2017
50	0.261	0.395	Freeway	2017
51	0.260	0.400	Freeway	2017
52	0.260	0.405	Freeway	2017
53	0.259	0.411	Freeway	2017
54	0.259	0.418	Freeway	2017
55	0.259	0.426	Freeway	2017
56	0.259	0.432	Freeway	2017
57	0.259	0.440	Freeway	2017
58	0.259	0.451	Freeway	2017
59	0.259	0.460	Freeway	2017
60	0.260	0.470	Freeway	2017
60.7	0.260	0.477	Freeway	2017

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2017 Summer - Arterial - All Vehicle Composite				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
2.5	1.961	0.671	Arterial	2017
3	1.577	0.645	Arterial	2017
4	1.099	0.612	Arterial	2017
5	0.811	0.592	Arterial	2017
6	0.702	0.557	Arterial	2017
7	0.625	0.531	Arterial	2017
8	0.566	0.512	Arterial	2017
9	0.521	0.497	Arterial	2017
10	0.485	0.485	Arterial	2017
11	0.460	0.467	Arterial	2017
12	0.439	0.452	Arterial	2017
13	0.421	0.439	Arterial	2017
14	0.406	0.428	Arterial	2017
15	0.392	0.418	Arterial	2017
16	0.379	0.409	Arterial	2017
17	0.367	0.401	Arterial	2017
18	0.357	0.393	Arterial	2017
19	0.347	0.387	Arterial	2017
20	0.339	0.381	Arterial	2017
21	0.332	0.376	Arterial	2017
22	0.326	0.371	Arterial	2017
23	0.320	0.366	Arterial	2017
24	0.315	0.362	Arterial	2017

2017 Summer - Arterial - All Vehicle Composite				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
25	0.310	0.358	Arterial	2017
26	0.306	0.355	Arterial	2017
27	0.302	0.352	Arterial	2017
28	0.298	0.350	Arterial	2017
29	0.295	0.347	Arterial	2017
30	0.291	0.345	Arterial	2017
31	0.288	0.344	Arterial	2017
32	0.285	0.343	Arterial	2017
33	0.283	0.342	Arterial	2017
34	0.280	0.341	Arterial	2017
35	0.278	0.340	Arterial	2017
36	0.276	0.341	Arterial	2017
37	0.275	0.343	Arterial	2017
38	0.273	0.344	Arterial	2017
39	0.272	0.346	Arterial	2017
40	0.270	0.347	Arterial	2017
41	0.269	0.350	Arterial	2017
42	0.268	0.352	Arterial	2017
43	0.267	0.355	Arterial	2017
44	0.265	0.357	Arterial	2017
45	0.264	0.359	Arterial	2017
46	0.263	0.363	Arterial	2017
47	0.262	0.366	Arterial	2017
48	0.261	0.370	Arterial	2017
49	0.260	0.373	Arterial	2017
50	0.260	0.376	Arterial	2017
51	0.259	0.381	Arterial	2017
52	0.258	0.386	Arterial	2017
53	0.258	0.391	Arterial	2017
54	0.257	0.395	Arterial	2017
55	0.256	0.400	Arterial	2017
56	0.256	0.406	Arterial	2017
57	0.256	0.413	Arterial	2017
58	0.256	0.419	Arterial	2017
59	0.256	0.426	Arterial	2017
60	0.256	0.431	Arterial	2017
61	0.256	0.441	Arterial	2017
62	0.256	0.450	Arterial	2017
63	0.256	0.458	Arterial	2017
64	0.257	0.467	Arterial	2017
65	0.257	0.475	Arterial	2017

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2017 Winter CO - Freeway Light Duty Vehicle Composite			
Veh Speed	CO gr/mi	Road Type	Year
3	19.748	Freeway	2017
4	17.199	Freeway	2017
5	15.672	Freeway	2017
6	14.605	Freeway	2017
7	13.817	Freeway	2017
8	13.230	Freeway	2017
9	12.771	Freeway	2017
10	12.406	Freeway	2017
11	12.122	Freeway	2017
12	11.907	Freeway	2017
13	11.727	Freeway	2017
14	11.573	Freeway	2017
15	11.443	Freeway	2017
16	11.353	Freeway	2017
17	11.323	Freeway	2017
18	11.299	Freeway	2017
19	11.279	Freeway	2017
20	11.259	Freeway	2017
21	11.243	Freeway	2017
22	11.223	Freeway	2017
23	11.213	Freeway	2017
24	11.199	Freeway	2017
25	11.189	Freeway	2017
26	11.179	Freeway	2017
27	11.169	Freeway	2017
28	11.159	Freeway	2017
29	11.149	Freeway	2017
30	11.139	Freeway	2017
31	11.149	Freeway	2017
32	11.159	Freeway	2017
33	11.169	Freeway	2017
34	11.179	Freeway	2017
35	11.194	Freeway	2017
36	11.264	Freeway	2017
37	11.324	Freeway	2017
38	11.384	Freeway	2017
39	11.444	Freeway	2017
40	11.510	Freeway	2017
41	11.575	Freeway	2017
42	11.640	Freeway	2017
43	11.705	Freeway	2017
44	11.761	Freeway	2017
45	11.831	Freeway	2017

2017 Winter CO - Freeway Light Duty Vehicle Composite			
Veh Speed	CO gr/mi	Road Type	Year
46	11.901	Freeway	2017
47	11.961	Freeway	2017
48	12.026	Freeway	2017
49	12.091	Freeway	2017
50	12.162	Freeway	2017
51	12.226	Freeway	2017
52	12.292	Freeway	2017
53	12.362	Freeway	2017
54	12.432	Freeway	2017
55	12.498	Freeway	2017
56	12.568	Freeway	2017
57	12.633	Freeway	2017
58	12.703	Freeway	2017
59	12.773	Freeway	2017
60	12.843	Freeway	2017
60.7	12.889	Freeway	2017
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2017 Winter CO - Freeway - Bus			
Veh Speed	CO gr/mi	Road Type	Year
3	5.373	Freeway	2017
4	4.916	Freeway	2017
5	4.642	Freeway	2017
6	4.270	Freeway	2017
7	3.909	Freeway	2017
8	3.639	Freeway	2017
9	3.429	Freeway	2017
10	3.261	Freeway	2017
11	3.079	Freeway	2017
12	2.867	Freeway	2017
13	2.687	Freeway	2017
14	2.533	Freeway	2017
15	2.399	Freeway	2017
16	2.274	Freeway	2017
17	2.143	Freeway	2017
18	2.026	Freeway	2017
19	1.922	Freeway	2017
20	1.829	Freeway	2017
21	1.742	Freeway	2017
22	1.659	Freeway	2017
23	1.583	Freeway	2017

2017 Winter CO - Freeway - Bus			
Veh Speed	CO gr/mi	Road Type	Year
24	1.513	Freeway	2017
25	1.449	Freeway	2017
26	1.391	Freeway	2017
27	1.337	Freeway	2017
28	1.288	Freeway	2017
29	1.242	Freeway	2017
30	1.198	Freeway	2017
31	1.161	Freeway	2017
32	1.127	Freeway	2017
33	1.095	Freeway	2017
34	1.065	Freeway	2017
35	1.036	Freeway	2017
36	1.015	Freeway	2017
37	0.994	Freeway	2017
38	0.975	Freeway	2017
39	0.956	Freeway	2017
40	0.942	Freeway	2017
41	0.931	Freeway	2017
42	0.921	Freeway	2017
43	0.911	Freeway	2017
44	0.903	Freeway	2017
45	0.901	Freeway	2017
46	0.900	Freeway	2017
47	0.898	Freeway	2017
48	0.897	Freeway	2017
49	0.902	Freeway	2017
50	0.910	Freeway	2017
51	0.917	Freeway	2017
52	0.924	Freeway	2017
53	0.937	Freeway	2017
54	0.955	Freeway	2017
55	0.973	Freeway	2017
56	0.990	Freeway	2017
57	1.012	Freeway	2017
58	1.044	Freeway	2017
59	1.075	Freeway	2017
60	1.106	Freeway	2017
60.7	1.126	Freeway	2017
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2017 Winter CO - Freeway All Vehicle Composite			
Veh Speed	CO gr/mi	Road Type	Year
3	19.651	Freeway	2017
4	17.106	Freeway	2017
5	15.580	Freeway	2017
6	14.473	Freeway	2017
7	13.639	Freeway	2017
8	13.013	Freeway	2017
9	12.526	Freeway	2017
10	12.136	Freeway	2017
11	11.825	Freeway	2017
12	11.577	Freeway	2017
13	11.367	Freeway	2017
14	11.186	Freeway	2017
15	11.030	Freeway	2017
16	10.914	Freeway	2017
17	10.861	Freeway	2017
18	10.813	Freeway	2017
19	10.770	Freeway	2017
20	10.732	Freeway	2017
21	10.696	Freeway	2017
22	10.664	Freeway	2017
23	10.635	Freeway	2017
24	10.608	Freeway	2017
25	10.583	Freeway	2017
26	10.560	Freeway	2017
27	10.539	Freeway	2017
28	10.520	Freeway	2017
29	10.502	Freeway	2017
30	10.485	Freeway	2017
31	10.483	Freeway	2017
32	10.488	Freeway	2017
33	10.493	Freeway	2017
34	10.497	Freeway	2017
35	10.503	Freeway	2017
36	10.563	Freeway	2017
37	10.619	Freeway	2017
38	10.673	Freeway	2017
39	10.723	Freeway	2017
40	10.780	Freeway	2017
41	10.841	Freeway	2017
42	10.900	Freeway	2017
43	10.955	Freeway	2017
44	11.010	Freeway	2017
45	11.076	Freeway	2017
46	11.139	Freeway	2017
47	11.199	Freeway	2017

2017 Winter CO - Freeway All Vehicle Composite			
Veh Speed	CO gr/mi	Road Type	Year
48	11.257	Freeway	2017
49	11.324	Freeway	2017
50	11.391	Freeway	2017
51	11.456	Freeway	2017
52	11.519	Freeway	2017
53	11.589	Freeway	2017
54	11.667	Freeway	2017
55	11.743	Freeway	2017
56	11.816	Freeway	2017
57	11.891	Freeway	2017
58	11.975	Freeway	2017
59	12.057	Freeway	2017
60	12.135	Freeway	2017
60.7	12.189	Freeway	2017

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2017 Winter CO - Arterial All Vehicle Composite			
Veh Speed	CO gr/mi	Road Type	Year
2.5	21.471	Arterial	2017
3	19.435	Arterial	2017
4	16.891	Arterial	2017
5	15.364	Arterial	2017
6	14.330	Arterial	2017
7	13.591	Arterial	2017
8	13.037	Arterial	2017
9	12.606	Arterial	2017
10	12.261	Arterial	2017
11	11.981	Arterial	2017
12	11.747	Arterial	2017
13	11.549	Arterial	2017
14	11.380	Arterial	2017
15	11.233	Arterial	2017
16	11.100	Arterial	2017
17	10.982	Arterial	2017
18	10.878	Arterial	2017
19	10.784	Arterial	2017
20	10.700	Arterial	2017
21	10.627	Arterial	2017
22	10.561	Arterial	2017
23	10.500	Arterial	2017
24	10.445	Arterial	2017
25	10.394	Arterial	2017
26	10.367	Arterial	2017
27	10.343	Arterial	2017

2017 Winter CO - Arterial All Vehicle Composite			
Veh Speed	CO gr/mi	Road Type	Year
28	10.320	Arterial	2017
29	10.299	Arterial	2017
30	10.279	Arterial	2017
31	10.283	Arterial	2017
32	10.287	Arterial	2017
33	10.291	Arterial	2017
34	10.294	Arterial	2017
35	10.298	Arterial	2017
36	10.358	Arterial	2017
37	10.414	Arterial	2017
38	10.468	Arterial	2017
39	10.518	Arterial	2017
40	10.567	Arterial	2017
41	10.628	Arterial	2017
42	10.687	Arterial	2017
43	10.743	Arterial	2017
44	10.796	Arterial	2017
45	10.847	Arterial	2017
46	10.910	Arterial	2017
47	10.970	Arterial	2017
48	11.028	Arterial	2017
49	11.084	Arterial	2017
50	11.137	Arterial	2017
51	11.202	Arterial	2017
52	11.265	Arterial	2017
53	11.325	Arterial	2017
54	11.383	Arterial	2017
55	11.439	Arterial	2017
56	11.512	Arterial	2017
57	11.582	Arterial	2017
58	11.650	Arterial	2017
59	11.715	Arterial	2017
60	11.779	Arterial	2017
61	11.855	Arterial	2017
62	11.928	Arterial	2017
63	11.999	Arterial	2017
64	12.068	Arterial	2017
65	12.135	Arterial	2017

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2026 Summer - Freeway - Light Duty Vehicle Composite				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
3	1.306	0.273	Freeway	2026
4	0.884	0.256	Freeway	2026
5	0.631	0.246	Freeway	2026
6	0.507	0.226	Freeway	2026
7	0.440	0.205	Freeway	2026
8	0.390	0.190	Freeway	2026
9	0.351	0.178	Freeway	2026
10	0.320	0.168	Freeway	2026
11	0.297	0.159	Freeway	2026
12	0.281	0.150	Freeway	2026
13	0.267	0.142	Freeway	2026
14	0.255	0.135	Freeway	2026
15	0.245	0.129	Freeway	2026
16	0.236	0.126	Freeway	2026
17	0.229	0.126	Freeway	2026
18	0.223	0.126	Freeway	2026
19	0.218	0.127	Freeway	2026
20	0.213	0.127	Freeway	2026
21	0.209	0.128	Freeway	2026
22	0.205	0.128	Freeway	2026
23	0.202	0.127	Freeway	2026
24	0.200	0.128	Freeway	2026
25	0.198	0.128	Freeway	2026
26	0.195	0.128	Freeway	2026
27	0.193	0.128	Freeway	2026
28	0.191	0.128	Freeway	2026
29	0.189	0.128	Freeway	2026
30	0.187	0.128	Freeway	2026
31	0.186	0.128	Freeway	2026
32	0.184	0.127	Freeway	2026
33	0.182	0.127	Freeway	2026
34	0.181	0.127	Freeway	2026
35	0.180	0.127	Freeway	2026
36	0.179	0.127	Freeway	2026
37	0.178	0.128	Freeway	2026
38	0.176	0.129	Freeway	2026
39	0.176	0.129	Freeway	2026
40	0.175	0.130	Freeway	2026
41	0.174	0.130	Freeway	2026
42	0.173	0.131	Freeway	2026
43	0.172	0.132	Freeway	2026
44	0.171	0.132	Freeway	2026
45	0.171	0.133	Freeway	2026

2026 Summer - Freeway - Light Duty Vehicle Composite				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
46	0.170	0.133	Freeway	2026
47	0.170	0.134	Freeway	2026
48	0.169	0.135	Freeway	2026
49	0.168	0.136	Freeway	2026
50	0.168	0.137	Freeway	2026
51	0.167	0.137	Freeway	2026
52	0.167	0.138	Freeway	2026
53	0.167	0.138	Freeway	2026
54	0.166	0.139	Freeway	2026
55	0.166	0.140	Freeway	2026
56	0.166	0.140	Freeway	2026
57	0.165	0.141	Freeway	2026
58	0.165	0.142	Freeway	2026
59	0.165	0.143	Freeway	2026
60	0.165	0.143	Freeway	2026
60.7	0.165	0.143	Freeway	2026

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2026 Summer - Freeway - Bus				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
3	0.673	2.595	Freeway	2026
4	0.636	2.477	Freeway	2026
5	0.614	2.406	Freeway	2026
6	0.581	2.302	Freeway	2026
7	0.548	2.200	Freeway	2026
8	0.523	2.123	Freeway	2026
9	0.504	2.064	Freeway	2026
10	0.489	2.016	Freeway	2026
11	0.471	1.962	Freeway	2026
12	0.448	1.895	Freeway	2026
13	0.429	1.839	Freeway	2026
14	0.413	1.790	Freeway	2026
15	0.398	1.748	Freeway	2026
16	0.384	1.708	Freeway	2026
17	0.368	1.665	Freeway	2026
18	0.354	1.627	Freeway	2026
19	0.341	1.592	Freeway	2026
20	0.330	1.561	Freeway	2026
21	0.319	1.533	Freeway	2026
22	0.307	1.506	Freeway	2026
23	0.297	1.482	Freeway	2026
24	0.287	1.459	Freeway	2026
25	0.278	1.439	Freeway	2026

2026 Summer - Freeway - Bus				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
26	0.269	1.421	Freeway	2026
27	0.261	1.408	Freeway	2026
28	0.253	1.395	Freeway	2026
29	0.246	1.383	Freeway	2026
30	0.239	1.372	Freeway	2026
31	0.232	1.366	Freeway	2026
32	0.226	1.363	Freeway	2026
33	0.220	1.361	Freeway	2026
34	0.214	1.358	Freeway	2026
35	0.209	1.357	Freeway	2026
36	0.204	1.365	Freeway	2026
37	0.200	1.373	Freeway	2026
38	0.196	1.380	Freeway	2026
39	0.191	1.387	Freeway	2026
40	0.188	1.401	Freeway	2026
41	0.184	1.421	Freeway	2026
42	0.181	1.440	Freeway	2026
43	0.178	1.458	Freeway	2026
44	0.175	1.477	Freeway	2026
45	0.172	1.512	Freeway	2026
46	0.170	1.546	Freeway	2026
47	0.168	1.579	Freeway	2026
48	0.165	1.610	Freeway	2026
49	0.164	1.658	Freeway	2026
50	0.162	1.712	Freeway	2026
51	0.161	1.763	Freeway	2026
52	0.159	1.813	Freeway	2026
53	0.158	1.878	Freeway	2026
54	0.157	1.959	Freeway	2026
55	0.157	2.038	Freeway	2026
56	0.156	2.113	Freeway	2026
57	0.155	2.203	Freeway	2026
58	0.155	2.324	Freeway	2026
59	0.155	2.441	Freeway	2026
60	0.155	2.555	Freeway	2026
60.7	0.155	2.632	Freeway	2026

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2026 Summer - Freeway - All Vehicle Composite				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
3	1.337	0.351	Freeway	2026
4	0.928	0.331	Freeway	2026
5	0.682	0.319	Freeway	2026
6	0.557	0.297	Freeway	2026
7	0.488	0.274	Freeway	2026
8	0.436	0.257	Freeway	2026
9	0.396	0.244	Freeway	2026
10	0.364	0.233	Freeway	2026
11	0.339	0.223	Freeway	2026
12	0.321	0.212	Freeway	2026
13	0.305	0.203	Freeway	2026
14	0.292	0.195	Freeway	2026
15	0.280	0.189	Freeway	2026
16	0.270	0.184	Freeway	2026
17	0.262	0.184	Freeway	2026
18	0.255	0.183	Freeway	2026
19	0.248	0.183	Freeway	2026
20	0.242	0.182	Freeway	2026
21	0.237	0.182	Freeway	2026
22	0.233	0.181	Freeway	2026
23	0.229	0.181	Freeway	2026
24	0.226	0.181	Freeway	2026
25	0.223	0.180	Freeway	2026
26	0.220	0.180	Freeway	2026
27	0.217	0.180	Freeway	2026
28	0.214	0.180	Freeway	2026
29	0.211	0.179	Freeway	2026
30	0.209	0.179	Freeway	2026
31	0.207	0.179	Freeway	2026
32	0.205	0.179	Freeway	2026
33	0.203	0.179	Freeway	2026
34	0.201	0.179	Freeway	2026
35	0.199	0.178	Freeway	2026
36	0.197	0.179	Freeway	2026
37	0.196	0.180	Freeway	2026
38	0.195	0.181	Freeway	2026
39	0.193	0.182	Freeway	2026
40	0.192	0.183	Freeway	2026
41	0.191	0.184	Freeway	2026
42	0.190	0.185	Freeway	2026
43	0.189	0.186	Freeway	2026
44	0.188	0.188	Freeway	2026
45	0.187	0.189	Freeway	2026

2026 Summer - Freeway - All Vehicle Composite				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
46	0.186	0.191	Freeway	2026
47	0.185	0.193	Freeway	2026
48	0.185	0.194	Freeway	2026
49	0.184	0.196	Freeway	2026
50	0.183	0.199	Freeway	2026
51	0.183	0.201	Freeway	2026
52	0.182	0.203	Freeway	2026
53	0.182	0.206	Freeway	2026
54	0.182	0.209	Freeway	2026
55	0.182	0.212	Freeway	2026
56	0.182	0.215	Freeway	2026
57	0.182	0.218	Freeway	2026
58	0.183	0.222	Freeway	2026
59	0.183	0.226	Freeway	2026
60	0.183	0.230	Freeway	2026
60.7	0.183	0.233	Freeway	2026

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2026 Summer - Arterial - All Vehicle Composite				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
2.5	1.633	0.374	Arterial	2026
3	1.305	0.358	Arterial	2026
4	0.896	0.338	Arterial	2026
5	0.650	0.326	Arterial	2026
6	0.558	0.305	Arterial	2026
7	0.492	0.290	Arterial	2026
8	0.442	0.278	Arterial	2026
9	0.404	0.269	Arterial	2026
10	0.373	0.262	Arterial	2026
11	0.352	0.251	Arterial	2026
12	0.334	0.242	Arterial	2026
13	0.319	0.235	Arterial	2026
14	0.306	0.228	Arterial	2026
15	0.295	0.222	Arterial	2026
16	0.284	0.217	Arterial	2026
17	0.274	0.212	Arterial	2026
18	0.265	0.208	Arterial	2026
19	0.257	0.204	Arterial	2026
20	0.249	0.201	Arterial	2026
21	0.244	0.198	Arterial	2026
22	0.239	0.195	Arterial	2026
23	0.234	0.193	Arterial	2026
24	0.230	0.190	Arterial	2026

2026 Summer - Arterial - All Vehicle Composite				
Veh Speed	VOC gr/mi	NOx gr/mi	Road Type	Year
25	0.226	0.188	Arterial	2026
26	0.222	0.186	Arterial	2026
27	0.218	0.185	Arterial	2026
28	0.215	0.183	Arterial	2026
29	0.212	0.182	Arterial	2026
30	0.209	0.180	Arterial	2026
31	0.207	0.179	Arterial	2026
32	0.204	0.179	Arterial	2026
33	0.202	0.178	Arterial	2026
34	0.200	0.177	Arterial	2026
35	0.198	0.177	Arterial	2026
36	0.197	0.177	Arterial	2026
37	0.195	0.178	Arterial	2026
38	0.194	0.179	Arterial	2026
39	0.193	0.180	Arterial	2026
40	0.191	0.180	Arterial	2026
41	0.190	0.182	Arterial	2026
42	0.189	0.183	Arterial	2026
43	0.188	0.184	Arterial	2026
44	0.187	0.185	Arterial	2026
45	0.186	0.186	Arterial	2026
46	0.185	0.188	Arterial	2026
47	0.185	0.190	Arterial	2026
48	0.184	0.191	Arterial	2026
49	0.183	0.193	Arterial	2026
50	0.182	0.194	Arterial	2026
51	0.182	0.196	Arterial	2026
52	0.181	0.199	Arterial	2026
53	0.181	0.201	Arterial	2026
54	0.180	0.203	Arterial	2026
55	0.180	0.205	Arterial	2026
56	0.180	0.208	Arterial	2026
57	0.180	0.210	Arterial	2026
58	0.180	0.213	Arterial	2026
59	0.180	0.216	Arterial	2026
60	0.180	0.218	Arterial	2026
61	0.180	0.222	Arterial	2026
62	0.180	0.226	Arterial	2026
63	0.181	0.229	Arterial	2026
64	0.181	0.233	Arterial	2026
65	0.181	0.236	Arterial	2026

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2026 Winter CO - Freeway - Light Duty Vehicle Composite			
Veh Speed	CO gr/mi	Road Type	Year
3	17.889	Freeway	2026
4	15.617	Freeway	2026
5	14.261	Freeway	2026
6	13.308	Freeway	2026
7	12.608	Freeway	2026
8	12.074	Freeway	2026
9	11.670	Freeway	2026
10	11.340	Freeway	2026
11	11.090	Freeway	2026
12	10.900	Freeway	2026
13	10.734	Freeway	2026
14	10.604	Freeway	2026
15	10.484	Freeway	2026
16	10.398	Freeway	2026
17	10.378	Freeway	2026
18	10.358	Freeway	2026
19	10.338	Freeway	2026
20	10.324	Freeway	2026
21	10.308	Freeway	2026
22	10.298	Freeway	2026
23	10.288	Freeway	2026
24	10.278	Freeway	2026
25	10.268	Freeway	2026
26	10.258	Freeway	2026
27	10.248	Freeway	2026
28	10.238	Freeway	2026
29	10.228	Freeway	2026
30	10.223	Freeway	2026
31	10.228	Freeway	2026
32	10.238	Freeway	2026
33	10.248	Freeway	2026
34	10.264	Freeway	2026
35	10.274	Freeway	2026
36	10.334	Freeway	2026
37	10.394	Freeway	2026
38	10.454	Freeway	2026
39	10.510	Freeway	2026
40	10.566	Freeway	2026
41	10.630	Freeway	2026
42	10.692	Freeway	2026
43	10.746	Freeway	2026
44	10.802	Freeway	2026
45	10.867	Freeway	2026

2026 Winter CO - Freeway - Light Duty Vehicle Composite			
Veh Speed	CO gr/mi	Road Type	Year
46	10.927	Freeway	2026
47	10.987	Freeway	2026
48	11.047	Freeway	2026
49	11.113	Freeway	2026
50	11.173	Freeway	2026
51	11.239	Freeway	2026
52	11.299	Freeway	2026
53	11.359	Freeway	2026
54	11.425	Freeway	2026
55	11.490	Freeway	2026
56	11.550	Freeway	2026
57	11.610	Freeway	2026
58	11.680	Freeway	2026
59	11.746	Freeway	2026
60	11.806	Freeway	2026
60.7	11.852	Freeway	2026

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2026 Winter CO - Freeway - Bus			
Veh Speed	CO gr/mi	Road Type	Year
3	2.001	Freeway	2026
4	1.831	Freeway	2026
5	1.729	Freeway	2026
6	1.590	Freeway	2026
7	1.456	Freeway	2026
8	1.356	Freeway	2026
9	1.277	Freeway	2026
10	1.215	Freeway	2026
11	1.147	Freeway	2026
12	1.068	Freeway	2026
13	1.001	Freeway	2026
14	0.943	Freeway	2026
15	0.894	Freeway	2026
16	0.847	Freeway	2026
17	0.798	Freeway	2026
18	0.755	Freeway	2026
19	0.716	Freeway	2026
20	0.681	Freeway	2026
21	0.649	Freeway	2026
22	0.618	Freeway	2026
23	0.590	Freeway	2026
24	0.564	Freeway	2026
25	0.540	Freeway	2026

2026 Winter CO - Freeway - Bus			
Veh Speed	CO gr/mi	Road Type	Year
26	0.518	Freeway	2026
27	0.498	Freeway	2026
28	0.480	Freeway	2026
29	0.462	Freeway	2026
30	0.446	Freeway	2026
31	0.432	Freeway	2026
32	0.420	Freeway	2026
33	0.408	Freeway	2026
34	0.397	Freeway	2026
35	0.386	Freeway	2026
36	0.378	Freeway	2026
37	0.370	Freeway	2026
38	0.363	Freeway	2026
39	0.356	Freeway	2026
40	0.351	Freeway	2026
41	0.347	Freeway	2026
42	0.343	Freeway	2026
43	0.340	Freeway	2026
44	0.336	Freeway	2026
45	0.336	Freeway	2026
46	0.335	Freeway	2026
47	0.335	Freeway	2026
48	0.334	Freeway	2026
49	0.336	Freeway	2026
50	0.339	Freeway	2026
51	0.342	Freeway	2026
52	0.344	Freeway	2026
53	0.349	Freeway	2026
54	0.356	Freeway	2026
55	0.362	Freeway	2026
56	0.369	Freeway	2026
57	0.377	Freeway	2026
58	0.389	Freeway	2026
59	0.401	Freeway	2026
60	0.412	Freeway	2026
60.7	0.419	Freeway	2026

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2026 Winter CO - Freeway - All Vehicle Composite			
Veh Speed	CO gr/mi	Road Type	Year
3	17.618	Freeway	2026
4	15.375	Freeway	2026
5	14.029	Freeway	2026
6	13.050	Freeway	2026
7	12.309	Freeway	2026
8	11.753	Freeway	2026
9	11.321	Freeway	2026
10	10.975	Freeway	2026
11	10.699	Freeway	2026
12	10.478	Freeway	2026
13	10.291	Freeway	2026
14	10.131	Freeway	2026
15	9.992	Freeway	2026
16	9.889	Freeway	2026
17	9.842	Freeway	2026
18	9.801	Freeway	2026
19	9.763	Freeway	2026
20	9.730	Freeway	2026
21	9.699	Freeway	2026
22	9.671	Freeway	2026
23	9.645	Freeway	2026
24	9.622	Freeway	2026
25	9.600	Freeway	2026
26	9.580	Freeway	2026
27	9.562	Freeway	2026
28	9.545	Freeway	2026
29	9.530	Freeway	2026
30	9.515	Freeway	2026
31	9.514	Freeway	2026
32	9.518	Freeway	2026
33	9.522	Freeway	2026
34	9.526	Freeway	2026
35	9.531	Freeway	2026
36	9.586	Freeway	2026
37	9.639	Freeway	2026
38	9.688	Freeway	2026
39	9.735	Freeway	2026
40	9.787	Freeway	2026
41	9.843	Freeway	2026
42	9.897	Freeway	2026
43	9.949	Freeway	2026
44	9.999	Freeway	2026
45	10.060	Freeway	2026

2026 Winter CO - Freeway - All Vehicle Composite			
Veh Speed	CO gr/mi	Road Type	Year
46	10.118	Freeway	2026
47	10.174	Freeway	2026
48	10.227	Freeway	2026
49	10.288	Freeway	2026
50	10.351	Freeway	2026
51	10.411	Freeway	2026
52	10.468	Freeway	2026
53	10.533	Freeway	2026
54	10.606	Freeway	2026
55	10.676	Freeway	2026
56	10.744	Freeway	2026
57	10.814	Freeway	2026
58	10.892	Freeway	2026
59	10.968	Freeway	2026
60	11.041	Freeway	2026
60.7	11.091	Freeway	2026

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2026 Winter CO - Arterial - All Vehicle Composite			
Veh Speed	CO gr/mi	Road Type	Year
2.5	19.223	Arterial	2026
3	17.429	Arterial	2026
4	15.186	Arterial	2026
5	13.840	Arterial	2026
6	12.924	Arterial	2026
7	12.270	Arterial	2026
8	11.779	Arterial	2026
9	11.397	Arterial	2026
10	11.092	Arterial	2026
11	10.843	Arterial	2026
12	10.635	Arterial	2026
13	10.459	Arterial	2026
14	10.309	Arterial	2026
15	10.178	Arterial	2026
16	10.060	Arterial	2026
17	9.955	Arterial	2026
18	9.863	Arterial	2026
19	9.780	Arterial	2026
20	9.705	Arterial	2026
21	9.639	Arterial	2026
22	9.580	Arterial	2026
23	9.526	Arterial	2026
24	9.476	Arterial	2026

2026 Winter CO - Arterial - All Vehicle Composite			
Veh Speed	CO gr/mi	Road Type	Year
25	9.430	Arterial	2026
26	9.407	Arterial	2026
27	9.386	Arterial	2026
28	9.367	Arterial	2026
29	9.349	Arterial	2026
30	9.332	Arterial	2026
31	9.336	Arterial	2026
32	9.339	Arterial	2026
33	9.343	Arterial	2026
34	9.346	Arterial	2026
35	9.349	Arterial	2026
36	9.404	Arterial	2026
37	9.457	Arterial	2026
38	9.506	Arterial	2026
39	9.553	Arterial	2026
40	9.597	Arterial	2026
41	9.654	Arterial	2026
42	9.708	Arterial	2026
43	9.759	Arterial	2026
44	9.808	Arterial	2026
45	9.855	Arterial	2026
46	9.914	Arterial	2026
47	9.969	Arterial	2026
48	10.023	Arterial	2026
49	10.074	Arterial	2026
50	10.123	Arterial	2026
51	10.183	Arterial	2026
52	10.241	Arterial	2026
53	10.297	Arterial	2026
54	10.350	Arterial	2026
55	10.402	Arterial	2026
56	10.469	Arterial	2026
57	10.534	Arterial	2026
58	10.597	Arterial	2026
59	10.658	Arterial	2026
60	10.717	Arterial	2026
61	10.788	Arterial	2026
62	10.856	Arterial	2026
63	10.922	Arterial	2026
64	10.987	Arterial	2026
65	11.049	Arterial	2026

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Appendix C
SNHPC Report

Southern New Hampshire Planning Commission
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Air Quality Analysis

for the
FY 2007- FY 2010 Transportation Improvement Program
and
Regional Transportation Plan

Prepared by the
Southern New Hampshire Planning Commission

December 2006

INTRODUCTION

Section I

This report presents the results of an air quality analysis of the Southern New Hampshire Planning Commission's FY 2007 – FY 2010 Transportation Improvement Program and Regional Transportation Plan. The Clean Air Act requires a conformity demonstration of the Transportation Plan and TIP in any area designated as "non-attainment" for a pollutant for which National Ambient Air Quality Standard (NAAQS) exists. Portions of the Seacoast and Southern New Hampshire areas have been designated as non-attainment for ground level ozone. In addition, the City of Manchester was previously designated non-attainment for carbon monoxide (CO). The City is required to demonstrate conformity to a 20 year maintenance plan to ensure it continues to achieve compliance with the CO standard.

The air quality analysis focuses on three types of emissions: Volatile Organic Compounds (VOC), Nitrogen Oxides (NOx) and Carbon Monoxide (CO). Both VOC and NOx have been identified to be precursors to ozone production. Regulations regarding conformity determinations are found in Title 40 Code of Federal Regulations Part 93. These rules were amended in July 2004 to incorporate methodologies to be used to demonstrate conformity under the new, more stringent 8-hour ozone standard.

The Southern New Hampshire Planning Commission region consists of the **City of Manchester** and twelve surrounding towns which include:

Auburn	**Chester**	**Goffstown**	**New Boston**
Bedford	**Deerfield**	**Hooksett**	**Raymond**
Candia	**Derry**	**Londonderry**	**Weare**

All of the communities in the SNHPC region with the exception of Deerfield, New Boston and Weare are included in the Boston-Manchester-Portsmouth (SE), New Hampshire Non-Attainment area. Additionally, the Towns of Derry and Londonderry are part of the previously designated Serious Southern New Hampshire Non-Attainment area. The Serious Southern New Hampshire Non-Attainment area has been retained for this conformity analysis by the Environmental Protection Agency (EPA) and the Federal Highway Administration (FHWA) until a motor vehicle budget for the 8-hour ozone non-attainment area has been established.

I-1 Background Information

In 1997, the EPA proposed to replace the 1-Hour Ozone standard with a new 8-Hour standard, along with adding a new fine particle standard ($PM_{2.5}$) to the existing PM_{10} standard. In April of 2004, the EPA designated new non-attainment areas based on the 8-Hour standard. Under the new standard, New Hampshire has a single, ozone non-attainment area (Boston-Manchester-Portsmouth (SE), New Hampshire Non-Attainment area). The relevant tests for conformity will be performed by the NHDOT once air quality analyses results for the entire non-attainment area have been received from the MPOs. Conformity under the 8-hour standard must be demonstrated for the State Implementation Plan (SIP) or the State will be in a lapse.

Under the direction of the New Hampshire Department of Transportation (NHDOT) and the New Hampshire Department of Environmental Services (NH DES), the SNHPC has been instructed to perform the following tests in order to complete the air quality analyses for this region:

For the communities in SNHPC portion of the Boston-Manchester-Portsmouth (SE), New Hampshire Non-Attainment area, the SNHPC will:

- Determine the “no-build” and “build” emissions of VOC and NOx for the specified analysis years and for the 2002 base year,
- Determine CO emissions for the “build” scenario for the City of Manchester, and
- Compare the “build” CO emissions to the CO emissions budget.

All analyses results will be submitted to the NHDOT who will combine the data received from the four MPOs in the non-attainment area and perform the following conformity tests:

- Compare the “build” emissions for all of the applicable towns within the Boston-Manchester-Portsmouth (SE), New Hampshire Non-Attainment area to the “no-build” emissions and the the 2002 baseline emissions,
- Compare the “build” emissions for all towns in the 1-hour budget area to the 1-hour budgets, and
- Compare the CO emissions to the CO budget.

If, based on this comparison, the “build” emissions are less that or equal to both the “no-build” emissions and the 2002 baseline emissions, and the “build” emissions in the budget areas are less that or equal to the budget, a finding will be made that the TIP and Plan conform to the SIP.

I-2 Changes Since The Last Conformity Analysis

The last conformity report, submitted to the NHDOT in May 2005, was designed to demonstrate conformity of the SNHPC Regional Transportation Plan, the FY 2005-2007 Transportation Improvement Program and the State’s Ten Year Transportation Improvement Program (FY 2007 – 2016) to the State Implementation Plan (SIP). The baseline year of 2002 has been retained from the previous analyses along with the 2007 budget year. The attainment year of 2009, which represents the attainment year under the 8-hour ozone standard has also been retained, along with the previous CO analysis years 2010 and 2017. Finally, 2026 has been established as the year representing the final year of the regional long-range plans. Therefore, the analysis years used in this air quality analysis are 2002 (baseline) 2007, 2009, 2010 (CO only), 2017 (ozone and CO), and 2026 (ozone and CO).

AIR QUALITY **Section II**

The following section presents the methodology used for air quality analysis for the Southern New Hampshire Planning Commission's FY 2007 – FY 2010 Transportation Improvement Program and the Regional Transportation Plan.

II-1 Projects Included In The Air Quality Analysis

Projects considered for air quality analysis could be grouped into two categories: Exempt projects and Not Exempt projects. These are defined as follows:

> Exempt Projects: Exempt projects are defined as highway and transit projects that are exempt from the requirement that a conformity determination be made. Examples of such projects might include, but are not limited to, hazard elimination programs, shoulder improvements, increasing sight distance, pavement resurfacing, purchase of support vehicles, vehicles for mass transit, planning and technical studies, etc. Such projects may proceed towards implementation even in the absence of a conforming Transportation Plan and TIP. States and MPOs must ensure that exempt projects do not interfere with implementation of Transportation Control Measures.
>
> Not Exempt Projects: Non-Exempt projects include all FHWA/FTA funded projects and all regionally significant projects regardless of funding source that are not specifically exempted under Section 93.126 of Title 40 CFR.

Table 1 shows the list of Exempt projects in the Southern New Hampshire Planning Commission region. A brief description of some of these projects is provided in Appendix A towards the end of this report. The list of Not Exempt projects is provided in Table 2, with a brief description of some of the projects included in Appendix B. These lists (Table 1 and Table 2) also show if the projects are coded into the Regional Transportation Model. The projects and their completion years were determined from information from the Regional Transportation Plan, Transportation Improvement Program, and through consultation with SNHPC member communities and the NHDOT.

II-2 Analysis Years

The analysis years for the air quality analysis, summarized in Section I-2, are shown in Table 3.

TABLE 3 : ANALYSIS YEARS

Ozone Non-Attainment Area	Classification	Analysis Year
Base Year		2002
Auburn, Bedford, Candia, Chester, Derry, Goffstown, Hooksett, Londonderry, Manchester, Raymond	Boston-Manchester-Portsmouth (SE), NH Non-Attainment	2007
		2009
		2017
		2026
CO Non-Attainment Area	**Classification**	**Analysis Year**
Manchester	Not Classified	2007
		2010
		2026

Source: EPA Non-attainment Area Classifications

TABLE 1 LIST OF EXEMPT PROJECTS

Community[1]	Area Designation[2]	Project	Exempt Code[3]	Project #	Included in the Model
AU	B-M-P	Replace Bridge over Preston Brook on Dearborn Road	E-19	14082	No
BE	B-M-P	NH101 Roadway/Bridge Reconstruction from I-293 Interchange West to Plummer Rd	E-10	10018D	No
BE	B-M-P	Replace Bridge on US3 Over F.E.Everett Turnpike & Associated Approach Work	E-19	13527	No
BE	B-M-P	Replace Bridge over McQuade Brook on Campbell Road	E-19	14070	No
BE	B-M-P	Rehabilitate Bridge over Riddle Brook on North Amherst Road	E-19	14084	No
BE	B-M-P	Safety Improvements at Hardy/Jenkins Road Intersection	E-51		No
BE	B-M-P	Landscaping Kilton Rd, US3, Berm Along NH 101 On-Ramp	E-42	10018F	No
BE	B-M-P	Intersection Improvement at Hardy/Jenkins	E-52	13692A	No
BE-MA-LO	B-M-P/B-M-P and CONAT/B-M	Earthwork contract west of the Merrimack River	E-42	11512J	No
BE-MA-LO	B-M-P/B-M-P and CONAT/B-M	Selects, final paving and miscellaneous west of Merrimack river	E-10	11512 K	No
CH	B-M-P	Replace Bridge Over North Pond Brook on Fremont Road	E-19	13696	No
DE	B-M-P	Intersection Improvement at NH 102 and NH 28	E-51	13249	No
DE	B-M-P	Rehab/Replace Bridge over Tributary 'G' on Bradford St	E-19	13648	No
DE	B-M-P	Rehab/Replace Bridge over Beaver Brook on Fordway Road	E-19	13650	No
DE	B-M-P	Rehab/Replace Bridge over Shield Brook on South Ave	E-19	13651	No
DE	B-M-P	Rehab/Replace Bridge over Shield Brook on Florence Street	E-19	13652	No
DE	B-M-P	Intersection improvements at Kilrea Road & Windham Depot Road	E-52		No
DE	B-M-P	Reconstruction from Linlew Drive to Skobie Pond Road	E-10	14192	No
GO	B-M-P	Reconstruction of Mast St and N Main St	E-52		No
GO	B-M-P	Replace Bridge over Whittle Brook on Mountain Road	E-19	13686	No
GO	B-M-P	Replace Bridge over Harry Brook on Henry Bridge Road	E-19	13687	No
GO	B-M-P	Replace Bridge over Whittle Brook on Mountain Road	E-19	13695	No
HO	B-M-P	Rehabilitate rest area	E-15		No
HO	B-M-P	Bridge Rehabilitation over I-93/F.E.E.T	E-19	13715	No
HO	B-M-P	Maintenance building heating system replacement	E-45	14504	No
HO-HA	B-M-P	Re-ROOF Plaza Canopies	E-45	14508	No
LO	B-M-P	Mammoth Rd/Litchfield Stonehenge/Bartley Hill Rd Intersection Study	E-34	13015	No
LO-DE	B-M-P/B-M-P	Construct Shoulders and Upgrade Drainage from NH 128 in Londonderry to Derry Compact Line	E-4	13791	No
MA	B-M-P and CONAT	Operating Assistance for Fixed Route and Paratransit System (Two in one)	E-21		No
MA	B-M-P and CONAT	Capital Assistance for Preventive Maintenance of MTA Fleet	E-30		No
MA	B-M-P and CONAT	Capital Purchases	E-30		No
MA	B-M-P and CONAT	Replacement Buses	E-30		No
MA	B-M-P and CONAT	Railroad and Highway Grade Crossings in Granite Street Area, Reconstruct Crossing and Signals at B&M RR	E-1		No
MA	B-M-P and CONAT	I-293/FEET Reconstruction and Bridge Rehab between NH 101 and Granite Street	E-10		No
MA	B-M-P and CONAT	Replace Radio System	E-25		No
MA	B-M-P and CONAT	Paratransit Scheduling Software	E-24		No
MA	B-M-P and CONAT	Maintenance Management Software	E-24		No
MA	B-M-P and CONAT	Pavement Rehab and Bridge Recons from Merrimack River East to I-93 Int	E-10	12110B	No
MA	B-M-P and CONAT	Pvmt Rehab of I-93/I-293 Ramps & Rehab Brdg Decks Over Mammoth Rd	E-10	12110C	No
MA	B-M-P and CONAT	FEE Turnpike - Relocation of Allard Dr,Turner St, and Utilities	E-53	10622B	No
SA/MA	B-M-P/B-M-P and CONAT	Environmental Impact Study	E-34	10418C	No
SA/MA	B-M-P/B-M-P and CONAT	Wetland Mitigation, Acquisition, Design, and Construction	E-40	10418E	No
MA	B-M-P and CONAT	Roadway Reconstruction and Bridge Rehabilitation between NH 101 and Granite Street:144/066,146/065,149/063,153/061 I-293/Fee TPK	E-19		No
MA	B-M-P and CONAT	Replacement buses & PARATRANSIT VANS	E-30		No
MA	B-M-P and CONAT	Replacement of ADA PARATRANSIT VANS	E-30		No

Community[1]	Area Designation[2]	Project	Exempt Code[3]	Project #	Included in the Model
MA	B-M-P and CONAT	Replacement of Transit service vehicles	E-30		No
MA	B-M-P and CONAT	Transit Facility Improvement/Shop Equipment Replacement	E-24		No
MA	B-M-P and CONAT	Transit office equipment /MIS Hardware% Software	E-24		No
MA	B-M-P and CONAT	Rehabilitate bridge over black brook between exits 6 & 7 - 099/066 & 099/067	E-19	14048	No
MA	B-M-P and CONAT	DECK Replacement; Pier Rehabilitation; Seismic retrofit, Over I-93 - 166/124 & 166/125	E-19	14170	No
MA	B-M-P and CONAT	Bridge replacement over HOGG Brook - 169/137	E-19	14306	No
MA	B-M-P and CONAT	Improvements to develop the former Manchester & Portmouth Branch Railroad for bicycle and pedestrian access from Tarrytown Road south to Lake Masssabesic. The project also includes construction of a pedestrian culvert at a pedestrian culvert at Peabody Ave.	E-52	14411	No
MA	B-M-P and CONAT	Piscataquog trailway phase III - Improve rail corridor from Biron Bridge to the city/town line with Goffstown. Rehabilitate wood trestle bridge over the Piscataquog River. This is the final phase of a 3 phase project. (Including project 13493)	E-52	14412	No
MA-WE	B-M-P and CONAT	Phase 2: Development of the former Manchester & No, Weare Railroad into an alternative Trans. System & Rec.Trail; construct remaining 1.3 miles abandoned railroad in Manchester which extends from west side of so. Main St. to Goffstown	E-52	13898	No
MA-AU	B-M-P and CONAT/B-M-P	Rehab from I-93 east to service brook (NH 101)	E-10	12609	No
MA	B-M-P and CONAT	Manchester Metropolitan Organization transit planning	E-36	5303-MP-1	No
MA-CO	B-M-P and CONAT	Replace signs & 3 overhead sign structures (OHSS) and remove 2 OHSS; OHSS locations are at I-293 Exit 4 and I-93 Exit 11 & 4	E-43	14099	No
MA-HO	B-M-P and CONAT/B-M-P	Cold plane 2 "And 3" Overlay From the Merrimack River to I-293 (1.0 Miles)	E-10		No
MA-HO	B-M-P and CONAT/B-M-P	Safety Improvements, Including shoulder widenings & intersection improvement	E-6	13917	No
SA-MA	B-M-P and CONAT/B-M-P	I-93 Reconstruction and Mitigation	E-40	10418	No
SA-MA	B-M-P and CONAT/B-M-P	Bus maintenance facility at Exit 5 (Londonderry)	E-53	10418N	No
SA-MA	B-M-P and CONAT/B-M-P	Construction of wetland mitigation sites in anticipation of wetland impacts associated with future Improvements to I-93 from Salem to Manchester. Includes: Londonderry L-8,L-8 Extension, L-12 sites; & Londonderry advance Mitigation/ wetland creation	E-40	10418F	No
SA-MA	B-M-P and CONAT/B-M-P	Water quality study	E-34	10418W	No
NA-CO	B-M-P	Central Turnpike Resurfacing for SFY 2006	E-10		No
NA-CO	B-M-P	Central Turnpike Resurfacing for SFY 2007	E-10		No
NA-CO	B-M-P	Central Turnpike Resurfacing for SFY 2005	E-10		No

Source: Fy 2007-2016 Ten-Year Plan, SNHPC Regional Transportation Plan 2006

[1] AU=Auburn, BE=Bedford, CO=Concord, DE=Derry, GO=Goffstown,HA=Hampton, HO=Hooksett, LO=Londonderry, MA=Manchester, NA=Nashua, SA=Salem, WE=Weare

[2] Area Designation: B-M-P=Boston-Manchester-Portsmouth (SE), NH Non-attainment Area, CONAT=CO Not Classified Non-Attainment Area

[3] Exempt Code. Explanation is given in Appendix E

TABLE 2 LIST OF NOT EXEMPT PROJECTS

Community[1]	Area Designation[2]	Project	Project #	Category	Regionally Significant Project	Included in the Model	Proposed Completion Year	Opening Year of AQ Analysis
BE	B-M-P	Construct WB-On & WB-Off Ramps From NH 101 to Kilton Rd [5]	10018E	No-Build	No	Yes	2005	2007
BE	B-M-P	Widen NH 101 to 5 Lanes from Constitution Dr up to Wallace Rd	13953	Build	No	Yes	2014	2017
BE	B-M-P	Widen NH 101 to 5 Lanes from Wallace Rd up to Amherst TL[3]		Build	No	Yes	2025	2026
BE	B-M-P	Widen US 3 to 5 Lanes from Bridge over FEET to Merrimack TL[3]		Build	No	Yes	2025	2026
BE	B-M-P	Toll Plaza Expansion Adding 1 Toll Booth in Each Direction - Fee Turnpike	13603	No-Build	No	Yes	2004	2007
BE	B-M-P	Widen Meetinghouse Road from US3 to Meetinghouse Terrace and Signalize the Intersection of Meetinghouse Road/NH 101 EB Ramps [5]	14367	Build	No	Yes	2010	2010
BE/HO	B-M-P	Electronic Toll Collection		No-Build	No	No	-	-
BE/MA/LO	B-M-P/B-M-P and CONAT/B-M-	Build Airport Access Road [5]	11512	Build	Yes	Yes	2011	2017
BE-MA	B-M-P/B-M-P and CONAT	Construction Bridge over Merrimack River, NH3A, and Bridge Box Culvert under NH - Airport Access Road	11512 A	Build	No	Yes	2011	2017
BE-Ma-LO	B-M-P/B-M-P and CONAT/B-M-	Construct Fee TPK bridge over Manchester airport Access road (MAAR) and Ramp A & C Bridge	11512 C	Build	No	Yes	2011	2017
BE-MA-LO	B-M-P/B-M-P and CONAT/B-M-	Construct Bridge over Little Cohas river and roadway into Manchester air port	11512D	Build	No	Yes	2011	2017
BE-MA-LO	B-M-P/B-M-P and CONAT/B-M-	Improve Access from F.E.E.T to Manchester Airport and surrounding area	11512E	Build	No	Yes	2011	2017
BE-Ma-LO	B-M-P/B-M-P and CONAT/B-M-	Construct US 3, Ramps H and J, and Airport Access Road Bridge Over Us 3	11512F	Build	Yes	Yes	2011	2017
BE-Ma-LO	B-M-P/B-M-P and CONAT/B-M-	Construct North of little Cohas bridge and final paving to NH 3A	11512H	Build	Yes	Yes	2011	2017
BE-Ma-LO	B-M-P/B-M-P and CONAT/B-M-	Widen FEE Turnpike	11512I	Build	Yes	Yes	2011	2017
DE/LO	B-M-P/B-M-P	Construction of Exit 4A -I-93	13065	Build	Yes	Yes	2011	2017
DE	B-M-P	Widen NH 28 to 5 Lanes from Ross's Corner to Londonderry Town Line		Build	No	Yes	2010	2010
HO	B-M-P	Intersection Improvement at US3/NH28 and NH 28 Bypass Int. & Coord signals [5]	12537	No-Build	Yes	Off-Mod	2005	2007
HO	B-M-P	Widen US3/NH28 to 5 Lanes from Benton Rd to Martins Ferry Rd [5]	12537A	Build	Yes	Yes	2008	2009
HO	B-M-P	Widen US3/NH28 to 5 Lanes from Martins Ferry Rd to West Alice Ave		Build	Yes	Yes	2025	2026
HO	B-M-P	Construct Southern Segment of US3/NH28 Alternate Bypass[3]		Build	Yes	Yes	2017	2017
HO	B-M-P	Construct Northern Segment of US3/NH28 Alternate Bypass[3]		Build	Yes	Yes	2025	2026
HO	B-M-P	Widen US3/NH28 to 5 Lanes from Legends Dr to Hunt Street[3]		Build	Yes	Yes	2017	2017
HO	B-M-P	Build a Connector Road between US3/NH28 and Merrimack Street[3]	14320	Build	No	Yes	2007	2007
LO	B-M-P	Widen NH 102 to 4 lanes from Hudson Town Line to NH 128[3]		Build	No	Yes	2025	2026
LO	B-M-P	Widen NH 102 to 5 lanes from I-93 East to Londonderry Road[3]		Build	No	Yes	2017	2017
LO	B-M-P	Widen NH 102 to 6 lanes from Buttrick Rd to NH 128[3]		Build	No	Yes	2017	2017
LO	B-M-P	Intersection Improvements at NH28/NH128 for safety and Traffic Flow		Build	No	Yes	2015	2017
LO	B-M-P	Coordinate Traffic Signals on NH 102 from I-93 to NH 128	13116	No-Build	No	Off-Model	2005	2007
LO	B-M-P	Construct approximately 6200 ft. of multipurpose path from Pills to Mammoth [5]	13872	Build	No	Off-Model	2007	2007
LO	B-M-P	Construct Pettingill Rd connecting Harvey Rd and Airport Access Rd[3,5]		Build	No	Yes	2011	2017
MA	B-M-P	Reconstruction of Exit 6 on I-293 [5]		Build	Yes	Yes	2025	2026
MA	B-M-P	Reconstruction of Exit 4 on I-293 [5]		Build	Yes	Yes	2025	2026
MA	B-M-P and CONAT	Reconstruct Exit 7 on FEE Turnpike to Become Full Interchange		Build	Yes	Yes	2016	2017
MA	B-M-P and CONAT	Construct 600 Space Park and Ride Structure [5]	13512	Build	No	Off-Model	2018	2025
MA	B-M-P and CONAT	I-293 Lane Widening from I-93 Interchange to Merrimack River	12110	No-Build	Yes	Yes	2005	2007
MA	B-M-P and CONAT	Ramp Addition (NB On and SB Off) to I-293 at Granite St Interchange [5]	10622	Build	Yes	Yes	2008	2009
MA	B-M-P and CONAT	Interchange reconstruction, replace bridge -134/066 and add ramps @ Exit 5/ Granite street (I-293/Fee Turnpike)	10622A	Build	Yes	Yes	2008	2009
MA	B-M-P and CONAT	Reconstruction of granite street interchange @ exit 5 (I-293/Fee Turnpike)	10622C	Build	Yes	Yes	2008	2009
MA	B-M-P and CONAT	Widen Granite St from Elm St up to South Main St	14025	Build	No	Yes	2008	2009
MA	B-M-P and CONAT	Widening from ELM street to Commercial Street- Granite Street	14025E	Build	No	Yes	2008	2009
MA	B-M-P and CONAT	Widening from commercial street to Merrimack River including bridge carrying Granite Street over the river	14025F	Build	No	Yes	2008	2009
MA	B-M-P and CONAT	Relocate Airport Entrance On Brown Ave		No-Build	Yes[4]	Yes	2003	2007
MA	B-M-P and CONAT	Widen Brown Ave to 5 Lanes from Goffs Falls Rd up to Airport Rd and to 4 Lanes from Airport Rd up to Hazelton Ave[3]		No-Build	No	Yes	2005	2007
MA	B-M-P and CONAT	Develop a multiuse bike/ped trail between airport and Manchester downtown[5]	13873	Build	No	Off-Model	2006	2007
SA/MA	B-M-P and CONAT	I-93 Widening from Exit 2 Northerly to Exit 4 (NH 102) [5]	10418A	Build	Yes	Yes	2014	2017
SA/MA	B-M-P and CONAT	I-93 Widening from Exit 4 to I-293 in Manchester [5]	10418B	Build	Yes	Yes	2014	2017
SA-MA	B-M-P and CONAT	Construct Bus Terminal building at Exit 4 Park & ride (Londonderry)[6]	10418M	No-Build	Yes	No	-	-
SA-MA	B-M-P and CONAT	Implementation of incident management and ITS Technologies for overall corridor, to improve	10418Z	Build	Yes	Off-Model	2007	2007

Community[1]	Area Designation[2]	Project	Project #	Category	Regionally Significant Project	Included in the Model	Proposed Completion Year	Opening Year of AQ Analysis
		efficiency before, during & after I-93 construction						
SA-MA	B-M-P and CONAT/B-M-P	Implement expanded bus service & new commuter incentive program. Purchase 14 commuter coaches & provide 3 years of operating support (includes CMAQ 06-22CM) [5,6]	10418 L	No-Build	Yes	No	-	-
SA-DE	B-M-P	CART		Build	No	No	-	-
MA	B-M-P and CONAT	MTA Downtown Circulator	06-12CM	Build	Yes	Off-Model	2009	2009
Regional	B-M-P	Optimization of traffic signal phasing and timing at 100 NHDOT maintained signalized intersections in four regions[7]	06-27CM	Build	No	No	-	-

Source: Fy 2007-2016 Ten-Year Plan, SNHPC Regional Transportation Plan 2006

[1] AU=Auburn, BE=Bedford, CA=Candia DE=Derry, GO=Goffstown, HO=Hooksett, LO=Londonderry, MA=Manchester, NB=New Boston, RA=Raymond, WE=Weare, SA=Salem

[2] Area Designation: B-M-P=Boston-Manchester-Portsmouth (SE), NH Non-attainment Area, CONAT=CO Not Classified Non-Attainment Area

[3] These projects are taken from various studies and are part of the Regional Transportation Plan

[4] Suggested by the NH DOT

[5] Proposed completion years estimated based on information received from NHDOT project manager.

[6] Credits claimed by other MPO.

[7] Air quality credits to be determined by NHDOT.

Updated 12/06/2006

II-3 Build And No-Build Scenarios

For each of the above analysis years, Build and No-Build scenarios were established. Projects having National Environmental Policy Act (NEPA) approval were placed in the No-Build scenario along with projects considered to be complete and operational at the time of the analysis.

If a project did not fall into any of the above categories, then the project was placed in the Build scenario. Once a project was placed in the Build scenario, it continued to be in the Build scenario for all of the analysis years and was not placed in the No-Build scenario until one of the above conditions was met.

II-4 Analysis Methodology

In general, emission due to automobile travel on a highway link is determined by multiplying the amount of Vehicle Miles Traveled (VMT) on the link and an emission factor corresponding to the average travel speed of the automobiles on that link. Specifically the formula is as follows:

$$\text{Emissions (kg/day)} = \frac{\text{VMT x Emission Factor (gm/mile)}}{1000}$$

VMTs are estimated from the Travel Demand Model using TP+ travel demand modeling software. VMT is essentially the product of the link length and an estimation of daily travel on the link. Emission factors are developed by the NH DES using the MOBILE6.2 model. In finding the average speed on a link (on a daily basis), it was observed that approximately 40 percent of the total traffic occurs during the congested periods of the day (7 A.M. to 9 A.M. and from 4 P.M. to 6 P.M.). As part of its output, the travel demand model also calculates the congested speed of the links which occurs during the rush (or congested) hours. Using this information, an average speed of any link is calculated using the weighted speeds during the congested and free flow conditions. Specifically this is calculated as follows:

Average Speed = 0.40 x Congested Speed + 0.60 x Free Flow Speed

The above calculations for each of the links in the *Travel Demand Model* provide emissions only on the coded links in the network. Trips on the coded links also use uncoded links, which produce emission that is not captured by the above calculations. In addition to these, there are *intrazonal*[1] *trips* which are estimated by the model but are not assigned. These trips also produce emission. An off-model adjustment was done to estimate the amount of emission generated by these two additional sources of trips. The methodology used is included in Appendix C. Emission factors are provided in Appendix D.

II-5 Special Generators

In order to consider the effect of sites that attract a large number of trips and whose trip production and attraction characteristics are not captured adequately by the trip generation equations, *special generators* were introduced in the Travel Demand Model. The following projects were considered for this purpose:

> Mall of New Hampshire Expansion in Manchester: To represent the expansion of the Mall to double its original capacity, a gradual increase in trips over the years was assumed. Specifically 3000, 3342, 4200, 4200, 6400, and 7300 trips were added to 2000, 2002, 2007, 2009, 2017, and 2026 year scenarios. Also as part of the Mall Expansion, South Willow St. was widened from John E. Devine Dr. to Huse Rd. and the corresponding changes were included in the model's network.

[1] Intrazonal trips are those trips that remain within the traffic analysis zone (TAZs)

Manchester Airport : The following trips were added to the Manchester airport traffic zone: for 2000, the addition of 13,318 trips, for 2002, the addition of 13,872 trips, for 2007, the addition of 16,038 trips, for 2009, the addition of 16,962 trips, for 2017, the addition of 21,218 trips, and for 2026, the addition of 26,944 trips.

Walmart Distribution Center in Raymond: A 1.2 million sq.ft. of Walmart Distribution Center located on the east side of NH Route 107, south of NH Route 101 in Raymond was represented by the addition of 1,470 daily trips to the affected traffic zone.

Retail Development at I-93 Exit 10 in Hooksett: This development includes a cluster of retail stores: a 126,200 sq.ft. Target Departmental store, a 123,700 sq.ft. Home Depot, a 114,800 sq.ft. BJ's Wholesale Club, a 86,584 sq.ft. Kohls' Departmental Store, a 78,716 sq.ft. Staples Home Office store, and a 6,000 sq.ft. restaurant. To represent the trip productions from this development site, the following trips were added to the affected traffic zone: 9,610 trips in 2007, 9610 trips in 2009, 19,220 trips in 2017, and 19,220 trips in 2026.

II-6 Credits for the Air Quality Analysis

Off-Model credits were taken for the following CMAQ projects. The emission reductions were obtained from the Air Quality analysis performed for each of these projects during the CMAQ application aprocess. The supporting documents are provided in Appendix F.

Signal Coordination on US3/NH28 in Hooksett (Project# 12537): This project involves coordinating traffic signals along the heavily traveled US3/NH28 corridor in the Town of Hooksett, starting from the intersection of NH 28 Bypass to the intersection of Legends Drive/Lindsay Road. The completion year of this project is 2005. This project will reduce motor vehicle emissions as follows:

Year	**2007**	**2009**	**2017**	**2026**
HC(kg/day)	1.00	0.83	0.37	0.36
NOx(kg/day)	0.36	0.31	0.11	0.08

Construct 600 Space Park And Ride Structure With Intermodel Transportation Center In Manchester (13512): This project involves constructing a 600 space park and ride structure with an intermodel transportation center and rail platform on a five acre site in Manchester. The structure will be used for carpool, vanpool, local and intercity bus and passenger rail modes. The air quality analysis shows that due to the elimination of single occupant vehicles, there will be a reduction of emissions as follows:

Year	**2026**
HC(kg/day)	3.59
NOx(kg/day)	3.02
CO (kg/day)	64.73

The total credits of HC and NOx were proportionately divided among all the regional city and towns based on their share of VMTs. CO credit is only for city of Manchester.

Londonderry NH 102 Signal Coordination Project (13116): This project involves synchronizing signal systems on NH 102 from I-93 exit 4 to NH 128. Credits were taken as follows:

Year	**2007**	**2009**	**2017**	**2026**
HC(kg/day)	1.04	0.85	0.42	0.37

NOx(kg/day)	0.35	0.30	0.12	0.1

Londonderry Sidewalk (13872): This project involves installing sidewalks and multi-purpose paths along Pillsbury Road and NH 128 in the Town of Londonderry. Emission credits were taken as follows:

Year	2007	2009	2017	2026
HC(kg/day)	0.04	0.03	0.01	0.01
NOx(kg/day)	0.03	0.03	0.01	0.01

South Manchester Rail Trail (13873): This project involves development of a multi-use bikeway/pedestrian trail that serves as a north-south connector between Manchester Airport to the south and the downtown Manchester to the north. The 3.3-mile corridor will connect with the Riverwalk and to the Piscataquog Trail heading west from Manchester to Goffstown. Because of the limited use of the facility during the winter months, no credits for CO have been assumed. Emission credits were taken as follows:

Year	2007	2009	2017	2026
HC(kg/day)	0.52	0.42	0.20	0.14
NOx(kg/day)	0.50	0.40	0.16	0.10

I-93 ITS Project #10418Z: The main goal of an Incident Management Program is to reduce congestion by minimizing the impacts of traffic incidents. Because the I-93 ITS project reduces delays resulting from traffic incidents, emissions are reduced. This project includes CMAQ Project #06-22CM. Credits of HC and NOx are taken as follows.

Year	2007	2009	2017	2026
HC(kg/day)	37.58	31.90	17.93	13.8
NOx(kg/day)	99.13	81.19	32.89	17.57

The total credits were summaried credits from Hooksett, Londonderry and Manchester.

CO credits for city Manchester are taken as follows.

Year	2010	2017	2026
CO (kg/day)	369.81	310.79	309.29

MTA Downtown Circulator 06-12CM: This project consists of increased transit service including a downtown parking, lunch and entertainment circulator shuttle in the central portion of the City of Manchester. Credits of HC and NOx are taken as follows.

Year	2009	2017	2026
HC(kg/day)	0.067	0.019	0.001
NOx(kg/day)	-2.078	-0.810	-0.204

CO credits are taken as follows.

Year	2010	2017	2026
CO (kg/day)	2.91	2.55	2.43

RESULTS OF AIR QUALITY ANALYSIS

Section III

A summary of the final results of the Vehicle Miles Traveled (VMT), and emission analyses are shown in Table 4. Table 4a shows the emission results for the Southern NH Serious non-attainment area that includes the Towns of Derry and Londonderry. Table 4b shows the same for the Boston-Manchester-Portsmouth (SE), NH Non-attainment Area. The VMT and emission values in this report reflect a 15 percent (provided by the New Hampshire Department of Transportation) increase above the daily average to represent the peak summer months.

In general, although there is an increase in VMT over the years, the emissions decrease due to cleaner vehicles and other actions taken by the State to reduce emissions. Tables 5a-5e show detailed results of VMT and emission analysis along with credits taken for the eligible projects. These credits are described in the previous section.

A CO analysis for the City of Manchester for winter months is shown in Table 6. The VMTs from the model are reduced by 9 percent to reflect the decrease in VMT during the winter months from the daily averages.

The relevant tests for conformity will be performed by the NHDOT/NH DES once air quality analysis results from the entire non-attainment area are available. Based on the results of these tests, a conformity determination for the Boston-Manchester-Portsmouth (SE), NH Non-Attainment area is made and will be documented.

TABLE 4 OZONE ANALYSIS SUMMARY

Table 4a Portion of SNHPC Region in the Southern NH Serious Non-Attainment Area

Year	Scenario	Daily VMT	VOC(Ton/day)	NOX(Ton/day)
2002	Base	1,811,934	2.042	3.825
2007	No Build	1,952,172	1.311	2.478
	Build	1,952,294	1.299	2.446
	% Change	0.01	-0.93	-1.30
2009	No Build	2,024,911	1.121	2.065
	Build	2,024,574	1.111	2.038
	% Change	-0.02	-0.94	-1.29
2017	No Build	2,240,627	0.632	0.869
	Build	2,257,676	0.629	0.868
	% Change	0.76	-0.4	-0.07
2026	No Build	2,512,228	0.507	0.492
	Build	2,531,402	0.505	0.496
	% Change	0.76	-0.42	0.80

Source: SNHPC Air Quality Analysis, December 2006

Table 4b Boston-Manchester-Portsmouth (SE), NH Non-attainment Area

Year	Scenario	Daily VMT	VOC(Kgs/day)	NOX(kgs/day)
2002 Base	Base	5,768,311	6,552	11,743
2007	No Build	6,239,457	4,213	7,566
	Build	6,237,191	4,189	7,498
	% Change	-0.04	-0.56	-0.90
2009	No Build	6,471,720	3,601	6,296
	Build	6,474,942	3,580	6,245
	% Change	0.05	-0.58	-0.8
2017	No Build	7,147,159	2,018	2,657
	Build	7,063,752	1,976	2,618
	% Change	-1.17	-2.09	-1.47
2026	No Build	7,965,835	1,608	1,519
	Build	7,870,440	1,573	1,496
	% Change	-1.20	-2.20	-1.53

Source: SNHPC Air Quality Analysis, December 2006

Table 5a 2002 Ozone Analysis Summary

2002 BASELINE RESULTS			
		EMISSION (kg/day)	
NON-ATTAINMENT AREA	VMT	HC	NOX
SOUTHERN NH Serious (Part)	1,811,934	2,042	3,825
Boston-Manchester-Portsmouth (SE), NH Non-attainment Are	5,768,311	6,552	11,743
TOTAL	7,580,245	8,594	15,568

Source: SNHPC Air Quality Analysis, December 2006

Boston-Manchester-Portsmouth (SE), NH Non-attainment Area: Not including Londonderry and Derry
Total: Including all Non-attainment area

Table 5b 2007 Ozone Analysis Summary

Londonderry NH 102 Signal Coordination			
NON-ATTAINMENT AREA	VMT	HC	NOX
SOUTHERN NH Serious (Part)	0	1.05	0.35
Boston-Manchester-Portsmouth (S	0	0.00	0.00
TOTAL	0	1.05	0.35

Hooksett US 3/NH 28 Signal Coordination			
NON-ATTAINMENT AREA	VMT	HC	NOX
SOUTHERN NH Serious (Part)	0	0.00	0.00
Boston-Manchester-Portsmouth (S	0	1.00	0.36
TOTAL	0	1.00	0.36

Londonderry Pillsbury/Mammoth Rd Sidewalk			
NON-ATTAINMENT AREA	VMT	HC	NOX
SOUTHERN NH Serious (Part)	53	0.036	0.035
Boston-Manchester-Portsmouth (S	0	0.000	0.000
TOTAL	53	0.036	0.035

South Manchester Rail Trail			
NON-ATTAINMENT AREA	VMT	HC	NOX
SOUTHERN NH Serious (Part)	0	0.00	0.00
Boston-Manchester-Portsmouth (S	760	0.52	0.50
TOTAL	760	0.52	0.50

I-93 ITS Project 10418Z			
NON-ATTAINMENT AREA	VMT	HC	NOX
SOUTHERN NH Serious (Part)	0	12.168	32.097
Boston-Manchester-Portsmouth (S	0	25.411	67.031
TOTAL	0	37.579	99.128

Total Credit			
NON-ATTAINMENT AREA	VMT	HC	NOX
SOUTHERN NH Serious (Part)	53	13.25	32.49
Boston-Manchester-Portsmouth (S	760	26.94	67.89
TOTAL	813	40.19	100.37

Source: SNHPC Air Quality Analysis, December 2006

2007 N0-BUILD RESULTS			
		EMISSION (kg/day)	
NON-ATTAINMENT AREA	VMT	HC	NOX
SOUTHERN NH Serious (Part)	1,952,172	1,311	2,478
Boston-Manchester-Portsmouth	6,239,457	4,213	7,566
TOTAL	8,191,629	5,524	10,044

2007 BUILD RESULTS w/out CREDIT			
		EMISSION (kg/day)	
NON-ATTAINMENT AREA	VMT	HC	NOX
SOUTHERN NH Serious (Part)	1,952,347	1,312	2,478
Boston-Manchester-Portsmouth	6,237,951	4,216	7,566
TOTAL	8,190,298	5,528	10,044

2007 BUILD RESULTS with CREDIT			
		EMISSION (kg/day)	
NON-ATTAINMENT AREA	VMT	HC	NOX
SOUTHERN NH Serious (Part)	1,952,294	1,299	2,446
Boston-Manchester-Portsmouth	6,237,191	4,189	7,498
TOTAL	8,189,485	5,488	9,944

Table 5c 2009 Ozone Analysis Summary

Manchester Downtown Circulator			
NON-ATTAINMENT AREA	VMT	HC	NOX
SOUTHERN NH Serious (Part)	0	0.00	0.00
MANCHESTER Marginal (Part)	71	0.07	-2.08
TOTAL	71	0.07	-2.08

Londonderry NH 102 Signal Coordination			
NON-ATTAINMENT AREA	VMT	HC	NOX
SOUTHERN NH Serious (Part)	0	0.85	0.30
Boston-Manchester-Portsmouth (S	0	0.00	0.00
TOTAL	0	0.85	0.30

Hooksett US 3/NH 28 Signal Coordination			
NON-ATTAINMENT AREA	VMT	HC	NOX
SOUTHERN NH Serious (Part)	0	0.00	0.00
Boston-Manchester-Portsmouth (S	0	0.83	0.31
TOTAL	0	0.83	0.31

Londonderry Pillsbury/Mammoth Rd Sidewalk			
NON-ATTAINMENT AREA	VMT	HC	NOX
SOUTHERN NH Serious (Part)	53	0.030	0.028
Boston-Manchester-Portsmouth (S	0	0.000	0.000
TOTAL	53	0.030	0.028

South Manchester Rail Trail			
NON-ATTAINMENT AREA	VMT	HC	NOX
SOUTHERN NH Serious (Part)	0	0.00	0.00
Boston-Manchester-Portsmouth (S	760	0.42	0.40
TOTAL	760	0.42	0.40

I-93 ITS Project #10418Z			
NON-ATTAINMENT AREA	VMT	HC	NOX
SOUTHERN NH Serious (Part)	0	10.330	26.289
Boston-Manchester-Portsmouth (S	0	21.573	54.901
TOTAL	0	31.903	81.189

Total Credit			
NON-ATTAINMENT AREA	VMT	HC	NOX
SOUTHERN NH Serious (Part)	53	11.21	26.62
Boston-Manchester-Portsmouth (S	831	22.89	53.53
TOTAL	884	34.11	80.15

Source: SNHPC Air Quality Analysis, December 2006

2009 N0-BUILD RESULTS			
		EMISSION (kg/day)	
NON-ATTAINMENT AREA	VMT	HC	NOX
SOUTHERN NH Serious (Part)	2,024,911	1,121	2,065
Boston-Manchester-Portsmouth	6,471,720	3,601	6,296
TOTAL	8,496,632	4,722	8,361

2009 BUILD RESULTS w/out CREDIT			
		EMISSION (kg/day)	
NON-ATTAINMENT AREA	VMT	HC	NOX
SOUTHERN NH Serious (Part)	2,024,627	1,122	2,065
Boston-Manchester-Portsmouth	6,475,773	3,603	6,298
TOTAL	8,500,400	4,725	8,363

2009 BUILD RESULTS with CREDIT			
		EMISSION (kg/day)	
NON-ATTAINMENT AREA	VMT	HC	NOX
SOUTHERN NH Serious (Part)	2,024,574	1,111	2,038
Boston-Manchester-Portsmouth	6,474,942	3,580	6,245
TOTAL	8,499,516	4,691	8,283

Table 5d 2017 Ozone Analysis Summary

Manchester Downtown Circluator			
NON-ATTAINMENT AREA	VMT	HC(kg/day)	NOX(kg/day)
SOUTHERN NH Serious (Part)	0	0.00	0.00
Boston-Manchester-Portsmou	71	0.02	-0.81
TOTAL	71	0.02	-0.81

Londonderry NH 102 Signal Coordination			
NON-ATTAINMENT AREA	VMT	HC(kg/day)	NOX(kg/day)
SOUTHERN NH Serious (Part)	0	0.42	0.12
Boston-Manchester-Portsmou	0	0.00	0.00
TOTAL	0	0.42	0.12

Hooksett US 3/NH 28 Signal Coordination			
NON-ATTAINMENT AREA	VMT	HC(kg/day)	NOX(kg/day)
SOUTHERN NH Serious (Part)	0	0.00	0.00
Boston-Manchester-Portsmou	0	0.37	0.11
TOTAL	0	0.37	0.11

Londonderry Pillsbury/Mammoth Rd Sidewalk			
NON-ATTAINMENT AREA	VMT	HC(kg/day)	NOX(kg/day)
SOUTHERN NH Serious (Part)	53	0.014	0.011
Boston-Manchester-Portsmou	0	0.000	0.000
TOTAL	53	0.014	0.011

South Manchester Rail Trail			
NON-ATTAINMENT AREA	VMT	HC(kg/day)	NOX(kg/day)
SOUTHERN NH Serious (Part)	0	0.000	0.000
Boston-Manchester-Portsmou	760	0.200	0.159
TOTAL	760	0.200	0.159

I-93 ITS Project # 10418Z			
NON-ATTAINMENT AREA	VMT	HC(kg/day)	NOX(kg/day)
SOUTHERN NH Serious (Part)	0	5.805	10.650
Boston-Manchester-Portsmou	0	12.123	22.241
TOTAL	0	17.928	32.891

Total Credit			
NON-ATTAINMENT AREA	VMT	HC(kg/day)	NOX(kg/day)
SOUTHERN NH Serious (Part)	53	6.24	10.78
Boston-Manchester-Portsmou	831	12.71	21.70
TOTAL	884	18.95	32.48

Source: SNHPC Air Quality Analysis, December 2006

2017 N0-BUILD RESULTS			
		EMISSION (kg/day)	
NON-ATTAINMENT AREA	VMT	HC	NOX
SOUTHERN NH Serious (Part)	2,240,627	632	869
Boston-Manchester-Portsmouth (	7,147,159	2,018	2,657
TOTAL	9,387,786	2,649	3,525

2017 BUILD RESULTS w/out CREDIT			
		EMISSION (kg/day)	
NON-ATTAINMENT AREA	VMT	HC	NOX
SOUTHERN NH Serious (Part)	2,257,729	635	879
Boston-Manchester-Portsmouth (	7,064,583	1,988	2,639
TOTAL	9,322,313	2,623	3,518

2017 BUILD RESULTS with CREDIT			
		EMISSION (kg/day)	
NON-ATTAINMENT AREA	VMT	HC(kg/day)	NOX(kg/day)
SOUTHERN NH Serious (Part)	2,257,676	629	868
Boston-Manchester-Portsmouth (	7,063,752	1,976	2,618
TOTAL	9,321,429	2,604	3,486

Table 5e 2026 Ozone Analysis Summary

Manchester Towntown Circulator			
NON-ATTAINMENT AREA	VMT	HC(kg/day)	NOX(kg/day)
SOUTHERN NH Serious (Part)	0	0.00	0.00
Boston-Manchester-Portsmou	71	0.00	-0.25
TOTAL	71	0.00	-0.25

Londonderry NH 102 Signal Coordination			
NON-ATTAINMENT AREA	VMT	HC(kg/day)	NOX(kg/day)
SOUTHERN NH Serious (Part)	0	0.37	0.10
Boston-Manchester-Portsmou	0	0.00	0.00
TOTAL	0	0.37	0.10

Hooksett US 3/NH 28 Signal Coordination			
NON-ATTAINMENT AREA	VMT	HC(kg/day)	NOX(kg/day)
SOUTHERN NH Serious (Part)	0	0.00	0.00
Boston-Manchester-Portsmou	0	0.36	0.08
TOTAL	0	0.36	0.08

Manchester 600 Space Park & Ride Structure			
NON-ATTAINMENT AREA	VMT	HC(kg/day)	NOX(kg/day)
SOUTHERN NH Serious (Part)	4934	0.82	0.69
Boston-Manchester-Portsmou	15343	2.55	2.14
TOTAL	20277	3.37	2.83

Londonderry Pillsbury/Mammoth Rd Sidewalk			
NON-ATTAINMENT AREA	VMT	HC(kg/day)	NOX(kg/day)
SOUTHERN NH Serious (Part)	53	0.010	0.007
Boston-Manchester-Portsmou	0	0.000	0.000
TOTAL	53	0.010	0.007

South Manchester Rail Trail			
NON-ATTAINMENT AREA	VMT	HC(kg/day)	NOX(kg/day)
SOUTHERN NH Serious (Part)	0	0.000	0.000
Boston-Manchester-Portsmou	760	0.143	0.098
TOTAL	760	0.143	0.098

I-93 ITS project #10418Z			
NON-ATTAINMENT AREA	VMT	HC(kg/day)	NOX(kg/day)
SOUTHERN NH Serious (Part)	0	4.469	5.690
Boston-Manchester-Portsmou	0	9.332	11.882
TOTAL	0	13.801	17.572

Total Credit			
NON-ATTAINMENT AREA	VMT	HC(kg/day)	NOX(kg/day)
SOUTHERN NH Serious (Part)	4987	5.67	6.48
Boston-Manchester-Portsmou	16174	12.39	13.96
TOTAL	22484	18.28	20.62

Source: SNHPC Air Quality Analysis, December 2006

2026 N0-BUILD RESULTS			
		EMISSION (kg/day)	
NON-ATTAINMENT AREA	VMT	HC	NOX
SOUTHERN NH Serious (Part)	2,512,228	507	492
Boston-Manchester-Portsmouth (SE), NH Non-attainment Are	7,965,835	1,608	1,519
TOTAL	10,478,062	2,115	2,012

2026 BUILD RESULTS w/out CREDIT			
		EMISSION (kg/day)	
NON-ATTAINMENT AREA	VMT	HC	NOX
SOUTHERN NH Serious (Part)	2,536,389	511	503
Boston-Manchester-Portsmouth (SE), NH Non-attainment Are	7,886,614	1,585	1,510
TOTAL	10,423,003	2,096	2,013

2026 BUILD RESULTS with CREDIT			
		EMISSION (kg/day)	
NON-ATTAINMENT AREA	VMT	HC(kg/day)	NOX(kg/day)
SOUTHERN NH Serious (Part)	2,531,402	505	496
Boston-Manchester-Portsmouth (SE), NH Non-attainment Are	7,870,440	1,573	1,496
TOTAL	10,401,841	2,078	1,992

Boston-Manchester-Portsmouth (SE), NH Non-attainment Area: Not including Londonderry and Derry
Total: Including all Non-attainment area

Table 6 CO ANALYSIS RESULT FOR MANCHESTER

MTA DOWNTOWN CIRCULATOR		
Year	VMT	CO(kg / day)
2010	64.61	2.910
2017	64.61	2.554
2026	64.61	2.425

CO ANALYSIS RESULT FOR MANCHESTER WITHOUT CREDIT				
Year	Scenario	VMT	CO (ton / day)	CO Budget (ton / day)
2010	Build	2,107,376	29.04	55.83
2017	Build	2,295,002	24.97	55.83
2026	Build	2,517,894	24.87	55.83

I-93 ITS Project # 10418Z		
Year	VMT	CO(kg / day)
2010	0	369.811
2017	0	310.790
2026	0	309.287

CO ANALYSIS RESULT FOR MANCHESTER WITH CREDIT				
Year	Scenario	VMT	CO (ton / day)	CO Budget (ton / day)
2010	Build	2,107,311	28.66	55.83
2017	Build	2,294,938	24.66	55.83
2026	Build	2,512,196	24.49	55.83

Manchester 600 Space Park & Ride		
Year	VMT	CO(kg / day)
2026	5633.221	64.727

Total Credit		
Year	VMT	CO(kg / day)
2010	64.61	372.721
2017	64.61	313.344
2026	5697.83	376.439

Source: SNHPC Air Quality Analysis, December 2006

A Winter time adjustment factor of 0.91 is used as instructed by the NHDOT.

EXHIBITS

Exhibit A	Brief Description of Some Exempt Projects
Exhibit B	Brief Description of Some Not-Exempt
Exhibit C	Off-Model Adjustment Method to Emission Calculation
Exhibit D	Emission Factors
Exhibit E	Exempt Codes
Exhibit F	Off-Model Credit Documents

EXHIBIT A BRIEF DESCRIPTION OF SOME EXEMPT PROJECTS

- Intersection Improvement at NH 102 and NH 28 (Derry)

  This project involves modifying intersection geometry to relieve congestion and improve safety in the area. Turning lanes will be added on NH 102 and NH 28.

- Operating Assistance for Fixed Route and Para-transit System (Manchester MTA)

  This is an annual operating assistance to the Manchester Transit Authority in the amount of $2.27 million, $2.361 million, and $2.456 million for 2007, 2008, and 2009 respectively.

- Capital Assistance for Preventive Maintenance of MTA Fleet (Manchester MTA)

  This project involves purchasing equipments and services for preventive maintenance of MTA fleet. Funding for this project is as follows: $312,000 for FY 2007, $324,000 for FY 2008, and $337,000 for FY 2009.

EXHIBIT B BRIEF DESCRIPTION OF SOME NOT-EXEMPT AND CODED PROJECTS

- Airport Access Road (Bedford/Manchester/Londonderry) Project # 11512

  A four-lane highway will be constructed connecting F.E. Everett Turnpike to the Manchester Airport through relocated South Perimeter Rd. Grade separated interchanges at US 3 and Brown Ave will facilitate better access for these heavily traveled roadways to the airport and to the industrial park in the area. This project is expected to allow better access to the rapidly expanding Manchester airport and relieve congestion on Brown Ave, which is the major existing access point to the airport.

- Construction of Exit 4A on I-93 (Derry/Londonderry)

  This study is still in progress and a final alignment for Exit 4A is yet to be determined. This exit would be built between existing Exits 4 and 5 on I-93 and a new roadway will connect this exit with Folsom Rd in the Town of Derry. Folsom Road and Tsienneto Road will be improved as part of this project. This project would relieve congestion on NH102 in the Town of Derry. This project will also help in opening up some industrially zoned lands in Londonderry that are expected to contribute to the economic base for the Town of Londonderry.

- Widen NH 102 to Four Lanes from Hudson Town Line to NH 128 (Londonderry)

  This project involves widening of NH 102 from two to four lanes between the Hudson town line and NH 128 and intersection improvements along the corridor. As per the 2004 update of the NH 102 Corridor study for the Town of Londonderry, the corridor needs to be widened to either 6 lanes or 4 lanes by 2025 from the existing 2 lanes.

- Widen NH 102 from I-93 east to Londonderry Road (Londonderry)

  Widening of NH 102 corridor between I-93 and Londonderry Road from two to four-lanes with a center turn lane will be part of Exit 4A project.

- Widen NH 102 to 6 lanes from Buttrick Rd to NH 128 (Londonderry)

  The existing two-lane highway will be upgraded to a six-lane (three in each direction) highway between Buttrick Rd and NH 128. This will increase the capacity and traffic flow efficiency of the corridor. This is one of the main recommendations of the NH 102 Central Corridor Study for the Town of Londonderry.

- Coordinate Traffic Signals on NH 102 from I-93 to NH 128 (Londonderry) Project # 13116

  This project will involve installation of a coordinated traffic signal system along NH 102 corridor from I-93 interchange (Exit 4) westerly to the NH Route 128 intersection in Londonderry. This project is expected to improve traffic flow on NH Route 102 at intersections with I-93 NB/SB ramps, the Londonderry carpool lot, Gilcrest Rd, Appletree Mall, and NH Route 128.

- I-293 Lane Widening from I-93 interchange to Merrimack River (Manchester) Project # 12110

  This 2.6-mile section of the freeway carries a very high traffic volume all year long. As such, it suffers rather considerable amount of wear and tear. Rehabilitation of this section will involve paving and fixing of minor cracks and fills etc to the existing pavement. Due to the modification of the Airport Access Road layout, it is now necessary to add capacity to this section of the freeway and as such an additional lane in each direction will be added.

- Ramp Addition (NB On and SB Off) to I-293 at Granite St Interchange (Manchester) Project # 10622

  This project undertakes the construction of a northbound on-ramp and a southbound off-ramp on I-293 at Granite St to provide better access to the Manchester CBD.

- Widen Granite Street from Elm Street to South Main Street (Manchester)

  Upgrading Granite Street interchange on I-293 to a full interchange will increase traffic on Granite Street. Also, due to the new Civic Center on Elm Street and Granite Street intersection, traffic has increased on Granite Street. Due to all these factors, Granite Street is proposed to be widened from four lanes to six lanes throughout most of the length of Granite Street. On the bridge, it will be widened to seven lanes.

- Relocate Airport Entrance on Brown Ave (Manchester)

  Existing Airport Road (airport entrance) has been reconfigured for a smoother flow of traffic into and out of the airport and for a seamless merge with the proposed airport access road.

- I-93 Widening from Exit 2 Northerly to Exit 4 (Salem/Manchester) (Project # 10418A)

  Interstate 93 South of Exit 4 near the Derry/Windham town line is a four-lane facility that experiences severe congestion during the peak commute periods and during holidays when tourists are traveling to the northern areas of the state for recreation. In order to relieve existing congestion and accommodate future demands, this facility will be upgraded to an eight-lane facility.

- I-93 Widening from Exit 4 to I-293 in Manchester (Salem/Manchester) (Project # 10418B)

  For similar reasons portrayed for its conjugate project (# 10418A), the existing four-lane facility will be upgraded to eight-lanes upon completion of this project.

- Construct 600 Space Park and Ride Structure in Manchester (Manchester) (Project #13512)

  This project will involve constructing a 600 space park and ride structure with an inter-modal transportation center and rail platform on a five-acre site in Manchester. This facility will be used for carpool/vanpool, local and inter-city bus and passenger rail modes.

EXHIBIT C OFF-MODEL ADJUSTMENTS TO EMISSION CALCULATION

There are two major sources of VMTs : Interzonal Trip VMT
Intrazonal Trip VMT

Interzonal Trip VMT further has two sources : Coded Link VMT
Uncoded Link VMT

Combining the above we have these VMT sources : Interzonal Coded Link VMT
Interzonal Uncoded Link VMT
Intrazonal Trip VMT

In doing conformity analysis, we calculate emissions from all these three sources.

1) Interzonal Coded Emissions :

For each link in the network,

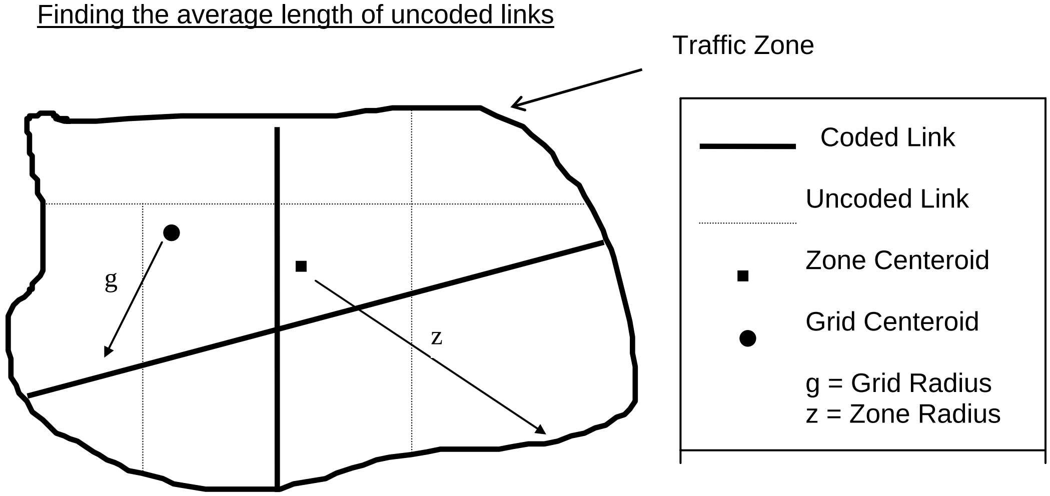
$$\text{Emission (kg/day)} = \frac{\text{Emission Factor (corresponding to average link speed in gm/mile)}}{1000} \times \text{VMT}$$

where,
Average Link Speed = 0.60 x Free-flow Speed (mph) + 0.40 x Congested Speed (mph)
VMT = Total volume on a link x Link distance (miles)

These equations are included in the emission calculation model, which provides VMTs, and emission for each of the links coded in the network. These values are then summed for all the coded links.

2) Interzonal Uncoded Emissions

<u>Finding the average length of uncoded links</u>



The above figure shows a traffic zone with coded and uncoded roads. Let's assume that the average length of uncoded road is the average radius of all the grids formed by the coded links.

So we can say, $\pi(g)^2$ x (No of grids in the TZ) = Area of the TZ

From the above equation we can find the average length of uncoded road,
g = $[(\text{Area of the TZ})/\{(\text{No. of grids in the TZ}) \times (\pi)\}]^{(1/2)}$

Finding Interzonal Trips

The INs, OUTs, and INTRAs are calculated using the MATRIX module after the trips are balanced in the TP+. The TOTAL column in this module is the sum of INS and OUTS (not INTRAS, because INS and OUTS have INTRAS included in them). So to find the *Interzonal trips*, INTRAS are subtracted from the TOTAL column.

Finding Interzonal Uncoded VMT

So, from the above two steps we have average uncoded link length and interzonal trips for each traffic zone. Now to find the VMT, we multiply interzonal trip and average uncoded link length :

Interzonal Uncoded VMT (for each TZ)
= Interzonal Trip in the TZ x Average Uncoded Link Length of the TZ

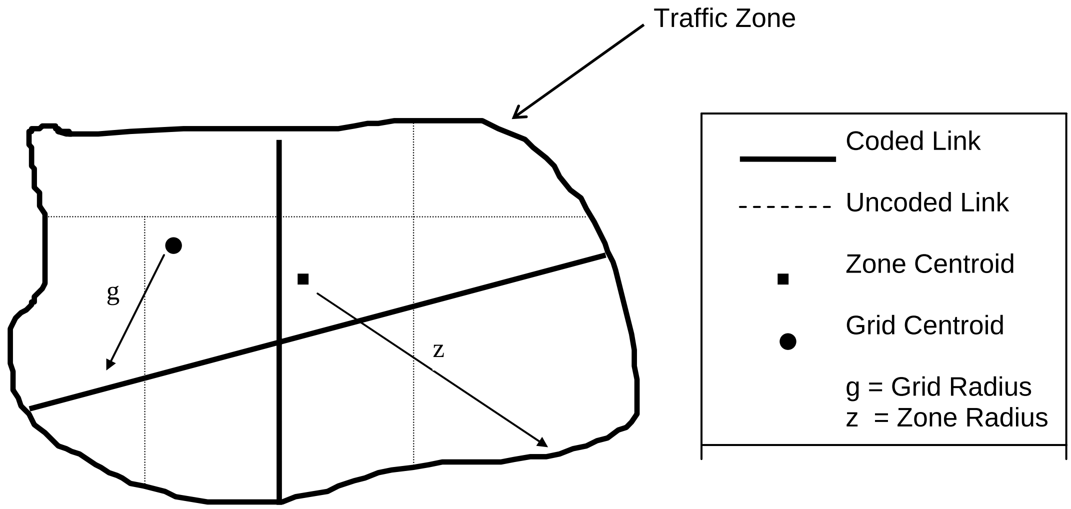
This is done for each traffic zone and the results are summed up to get the region wide VMT value.

Finding Interzonal Uncoded Emissions

Interzonal Uncoded Link Trip Emission for a TZ
= Interzonal Uncoded VMT for that TZ x Emission Factor

Now the question is, what emission factor to use, because emission factor depends on the average speed on the link. Since these are uncoded links, there is no information available on its speed. So, an average speed of 25 mph on these roads are assumed and the corresponding emission factor is selected for use in the emission calculation.

2) Intrazonal Emissions



Finding the average length of travel for intrazonal trips

It is assumed that the average length of travel for intrazonal trips is the average radius of the traffic zone.

So, If z is the average radius of the TZ, $\pi(z)^2$ = Area of TZ

Therefore, average length of travel, z = $\{(\text{Area of TZ})/(\pi)\}^{1/2}$

Finding Intrazonal Trips

As mentioned earlier INS,OUTS, and INTRAS for each traffic zone are calcultade in TP+ using the MATRIX module after trip balacing. The "INTRAS" are intrazonal trips.

Finding Intrazonal Trips VMT

Intrazonal Trip VMT (for any TZ)
= Intrazonal Trip for the TZ x Average Length of Travel for Intrazonal Trips in the TZ

Finding Intrazonal Trip Emissions
Intrazonal Trip Emission for a TZ
= Interzonal Trip VMT for that TZ x Emission Factor

For this case we assume an average speed of 30 mph and use the corresponding emission factor. All VMTs and emissions are summed to find the values for the entire region.

Example: Following is an example for a traffic zone taken from the study area:

Zone	Ins	Outs	Intra s (a)	Total (b)	Zone Radius (Mile) (c)	Grid Radius (Mile) (d)	Uncoded Link VMT (b-a)xd	Intrazonal VMT axc
1	11,498	11,498	2,460	22,997	0.79	0.32	6,571	1,943

Emission Calculation : Uncoded Links

The emission factors for HC and NOx at 25 mph speed are 1.272 and 2.013 (gm/mile) for freeways and 1.273 and 1.911 for arterials respectively for the year 2002 for which the above values were obtained. Hence, the HC emission on uncoded links = 6571 x 1.273 = 8,364 gm/day = 8.36 kg/day. Similar calculations yield 12.55 kg/day for NOx emission. In both of these calculations, the arterial factors used as freeways are always coded.

Intarzonal Trips

Emission factors for HC and NOx at 30 mph speed are 1.207 and 1.990 for freeways, and 1.199 and 1.843 (gm/mile) for arterials respectively for the year 2002. HC emission due to the intrazonal trips = 1943 x 1.199 = 2,329 gm/day = 2.33 kg/day. Similarly, the NOx emission is 3.58 kg/day. Arterial factors are used for similar reasons stated for uncoded link emission calculations.

EXHIBIT D MOBILE 6.2 Emission Factors for All Type Vehicle

	2002(gr/mi)				2007(gr/mi)				2009(gr/mi)			
	Freeway		Arterial		Freeway		Arterial		Freeway		Arterial	
Speed	VOC	NOx	VOC	Nox	VOC	Nox	VOC	NOx	VOC	NOx	VOC	NOx
2.5			8.053	3.524			5.197	2.156			4.142	1.735
3	6.641	3.477	6.485	3.386	4.255	2.083	4.142	2.071	3.395	1.669	3.306	1.667
4	4.682	3.305	4.525	3.214	2.935	1.977	2.822	1.965	2.350	1.584	2.261	1.582
5	3.506	3.202	3.349	3.111	2.144	1.914	2.031	1.902	1.723	1.533	1.634	1.531
6	2.900	3.026	2.888	2.932	1.751	1.805	1.744	1.789	1.412	1.445	1.407	1.440
7	2.556	2.848	2.558	2.804	1.538	1.694	1.539	1.709	1.242	1.355	1.244	1.375
8	2.297	2.714	2.311	2.708	1.378	1.611	1.385	1.649	1.115	1.288	1.122	1.327
9	2.097	2.610	2.119	2.634	1.254	1.546	1.266	1.602	1.016	1.236	1.027	1.289
10	1.936	2.527	1.965	2.574	1.155	1.494	1.170	1.565	0.936	1.194	0.951	1.259
11	1.813	2.445	1.861	2.482	1.080	1.443	1.108	1.506	0.877	1.153	0.902	1.211
12	1.723	2.357	1.774	2.405	1.027	1.387	1.057	1.458	0.834	1.108	0.860	1.172
13	1.647	2.283	1.700	2.340	0.982	1.340	1.013	1.416	0.798	1.070	0.826	1.139
14	1.582	2.219	1.637	2.285	0.943	1.300	0.976	1.381	0.767	1.037	0.796	1.110
15	1.525	2.164	1.582	2.237	0.910	1.265	0.943	1.351	0.740	1.009	0.770	1.086
16	1.478	2.124	1.530	2.189	0.881	1.240	0.912	1.320	0.718	0.989	0.745	1.061
17	1.441	2.110	1.484	2.148	0.859	1.230	0.885	1.294	0.700	0.980	0.723	1.040
18	1.408	2.097	1.443	2.111	0.839	1.221	0.860	1.270	0.684	0.973	0.703	1.021
19	1.378	2.086	1.407	2.078	0.821	1.213	0.839	1.249	0.670	0.967	0.686	1.004
20	1.351	2.075	1.374	2.048	0.805	1.206	0.819	1.230	0.657	0.961	0.670	0.988
21	1.328	2.066	1.346	2.021	0.790	1.199	0.802	1.212	0.646	0.956	0.657	0.974
22	1.307	2.057	1.320	1.996	0.778	1.193	0.787	1.197	0.636	0.951	0.645	0.961
23	1.289	2.048	1.297	1.973	0.767	1.187	0.773	1.182	0.627	0.946	0.634	0.950
24	1.272	2.041	1.276	1.952	0.757	1.182	0.761	1.169	0.619	0.942	0.624	0.939
25	1.256	2.034	1.256	1.933	0.747	1.177	0.749	1.156	0.612	0.938	0.614	0.929
26	1.242	2.028	1.239	1.917	0.738	1.173	0.739	1.146	0.605	0.935	0.606	0.921
27	1.228	2.023	1.223	1.902	0.730	1.170	0.729	1.137	0.598	0.932	0.598	0.913
28	1.215	2.019	1.209	1.888	0.722	1.167	0.720	1.128	0.592	0.930	0.591	0.906
29	1.203	2.015	1.195	1.875	0.715	1.164	0.712	1.120	0.586	0.928	0.585	0.900
30	1.192	2.011	1.182	1.863	0.708	1.162	0.705	1.113	0.581	0.926	0.579	0.894
31	1.180	2.008	1.169	1.858	0.701	1.160	0.697	1.109	0.575	0.925	0.573	0.891
32	1.167	2.007	1.156	1.852	0.694	1.159	0.690	1.106	0.570	0.924	0.567	0.888
33	1.156	2.005	1.144	1.847	0.687	1.158	0.683	1.103	0.565	0.923	0.562	0.886
34	1.145	2.003	1.133	1.842	0.681	1.157	0.677	1.100	0.560	0.923	0.557	0.884
35	1.135	2.002	1.122	1.838	0.676	1.157	0.671	1.097	0.556	0.922	0.552	0.882
36	1.128	2.009	1.115	1.844	0.671	1.161	0.666	1.102	0.552	0.926	0.548	0.885
37	1.121	2.015	1.108	1.850	0.667	1.166	0.662	1.107	0.549	0.930	0.545	0.889
38	1.114	2.020	1.102	1.856	0.663	1.170	0.658	1.111	0.545	0.933	0.542	0.893
39	1.108	2.026	1.095	1.861	0.659	1.174	0.654	1.115	0.542	0.937	0.539	0.896
40	1.102	2.035	1.090	1.867	0.655	1.180	0.650	1.119	0.540	0.942	0.536	0.899
41	1.096	2.047	1.084	1.879	0.651	1.189	0.646	1.127	0.537	0.949	0.533	0.906
42	1.090	2.058	1.078	1.890	0.648	1.197	0.643	1.135	0.534	0.956	0.530	0.913
43	1.085	2.069	1.072	1.901	0.645	1.205	0.640	1.143	0.531	0.962	0.528	0.919
44	1.080	2.080	1.067	1.912	0.641	1.213	0.636	1.151	0.529	0.968	0.525	0.925
45	1.074	2.099	1.062	1.922	0.638	1.226	0.633	1.158	0.526	0.979	0.523	0.931
46	1.069	2.116	1.057	1.939	0.635	1.239	0.630	1.170	0.524	0.989	0.521	0.941
47	1.064	2.133	1.052	1.956	0.632	1.251	0.627	1.182	0.521	0.999	0.518	0.951
48	1.059	2.149	1.047	1.972	0.628	1.262	0.624	1.194	0.519	1.009	0.516	0.961
49	1.054	2.172	1.042	1.988	0.625	1.279	0.621	1.205	0.517	1.022	0.514	0.970
50	1.049	2.198	1.038	2.002	0.622	1.297	0.618	1.216	0.515	1.037	0.511	0.978
51	1.044	2.222	1.033	2.027	0.620	1.315	0.615	1.233	0.513	1.052	0.509	0.993
52	1.040	2.246	1.029	2.050	0.617	1.332	0.613	1.250	0.511	1.065	0.507	1.006
53	1.036	2.276	1.024	2.073	0.615	1.353	0.610	1.266	0.509	1.083	0.505	1.020
54	1.033	2.312	1.020	2.095	0.613	1.379	0.608	1.282	0.508	1.104	0.503	1.033
55	1.029	2.347	1.016	2.116	0.611	1.404	0.605	1.297	0.506	1.125	0.502	1.045
56	1.026	2.381	1.013	2.150	0.609	1.428	0.603	1.321	0.505	1.144	0.500	1.065
57	1.023	2.421	1.010	2.183	0.607	1.457	0.602	1.345	0.504	1.167	0.499	1.084
58	1.021	2.473	1.007	2.214	0.606	1.494	0.600	1.367	0.503	1.198	0.498	1.102
59	1.018	2.523	1.004	2.245	0.605	1.530	0.598	1.389	0.502	1.227	0.497	1.120
60	1.015	2.571	1.002	2.274	0.603	1.565	0.597	1.410	0.502	1.255	0.496	1.137
60.7	1.014	2.604			0.602	1.588			0.501	1.275		
61			0.999	2.321			0.596	1.444			0.495	1.164
62			0.997	2.366			0.594	1.476			0.495	1.191
63			0.995	2.410			0.593	1.508			0.494	1.217
64			0.992	2.453			0.592	1.538			0.493	1.242
65			0.990	2.494			0.591	1.568			0.492	1.266

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EXHIBIT D MOBILE 6.2 Emission Factors for All Type Vehicle

	2017(gr/mi)					2026(gr/mi)			
	Freeway		Arterial			Freeway		Arterial	
Speed	VOC	Nox	VOC	Nox		VOC	NOx	VOC	NOx
2.5			1.961	0.671				1.633	0.374
3	1.615	0.643	1.577	0.645		1.337	0.351	1.305	0.358
4	1.136	0.610	1.099	0.612		0.928	0.331	0.896	0.338
5	0.848	0.590	0.811	0.592		0.682	0.319	0.650	0.326
6	0.702	0.555	0.702	0.557		0.557	0.297	0.558	0.305
7	0.621	0.518	0.625	0.531		0.488	0.274	0.492	0.290
8	0.559	0.491	0.566	0.512		0.436	0.257	0.442	0.278
9	0.512	0.470	0.521	0.497		0.396	0.244	0.404	0.269
10	0.473	0.453	0.485	0.485		0.364	0.233	0.373	0.262
11	0.444	0.436	0.460	0.467		0.339	0.223	0.352	0.251
12	0.422	0.418	0.439	0.452		0.321	0.212	0.334	0.242
13	0.404	0.403	0.421	0.439		0.305	0.203	0.319	0.235
14	0.388	0.390	0.406	0.428		0.292	0.195	0.306	0.228
15	0.374	0.379	0.392	0.418		0.280	0.189	0.295	0.222
16	0.362	0.371	0.379	0.409		0.270	0.184	0.284	0.217
17	0.353	0.369	0.367	0.401		0.262	0.184	0.274	0.212
18	0.344	0.367	0.357	0.393		0.255	0.183	0.265	0.208
19	0.337	0.365	0.347	0.387		0.248	0.183	0.257	0.204
20	0.330	0.363	0.339	0.381		0.242	0.182	0.249	0.201
21	0.324	0.362	0.332	0.376		0.237	0.182	0.244	0.198
22	0.319	0.361	0.326	0.371		0.233	0.181	0.239	0.195
23	0.315	0.359	0.320	0.366		0.229	0.181	0.234	0.193
24	0.311	0.358	0.315	0.362		0.226	0.181	0.230	0.190
25	0.307	0.357	0.310	0.358		0.223	0.180	0.226	0.188
26	0.303	0.356	0.306	0.355		0.220	0.180	0.222	0.186
27	0.300	0.355	0.302	0.352		0.217	0.180	0.218	0.185
28	0.297	0.355	0.298	0.350		0.214	0.180	0.215	0.183
29	0.294	0.354	0.295	0.347		0.211	0.179	0.212	0.182
30	0.291	0.354	0.291	0.345		0.209	0.179	0.209	0.180
31	0.288	0.353	0.288	0.344		0.207	0.179	0.207	0.179
32	0.286	0.353	0.285	0.343		0.205	0.179	0.204	0.179
33	0.283	0.353	0.283	0.342		0.203	0.179	0.202	0.178
34	0.281	0.353	0.280	0.341		0.201	0.179	0.200	0.177
35	0.279	0.353	0.278	0.340		0.199	0.178	0.198	0.177
36	0.277	0.354	0.276	0.341		0.197	0.179	0.197	0.177
37	0.276	0.356	0.275	0.343		0.196	0.180	0.195	0.178
38	0.274	0.357	0.273	0.344		0.195	0.181	0.194	0.179
39	0.273	0.358	0.272	0.346		0.193	0.182	0.193	0.180
40	0.271	0.360	0.270	0.347		0.192	0.183	0.191	0.180
41	0.270	0.363	0.269	0.350		0.191	0.184	0.190	0.182
42	0.269	0.366	0.268	0.352		0.190	0.185	0.189	0.183
43	0.268	0.368	0.267	0.355		0.189	0.186	0.188	0.184
44	0.267	0.370	0.265	0.357		0.188	0.188	0.187	0.185
45	0.265	0.374	0.264	0.359		0.187	0.189	0.186	0.186
46	0.264	0.378	0.263	0.363		0.186	0.191	0.185	0.188
47	0.263	0.382	0.262	0.366		0.185	0.193	0.185	0.190
48	0.263	0.385	0.261	0.370		0.185	0.194	0.184	0.191
49	0.262	0.390	0.260	0.373		0.184	0.196	0.183	0.193
50	0.261	0.395	0.260	0.376		0.183	0.199	0.182	0.194
51	0.260	0.400	0.259	0.381		0.183	0.201	0.182	0.196
52	0.260	0.405	0.258	0.386		0.182	0.203	0.181	0.199
53	0.259	0.411	0.258	0.391		0.182	0.206	0.181	0.201
54	0.259	0.418	0.257	0.395		0.182	0.209	0.180	0.203
55	0.259	0.426	0.256	0.400		0.182	0.212	0.180	0.205
56	0.259	0.432	0.256	0.406		0.182	0.215	0.180	0.208
57	0.259	0.440	0.256	0.413		0.182	0.218	0.180	0.210
58	0.259	0.451	0.256	0.419		0.183	0.222	0.180	0.213
59	0.259	0.460	0.256	0.426		0.183	0.226	0.180	0.216
60	0.260	0.470	0.256	0.431		0.183	0.230	0.180	0.218
60.7	0.260	0.477				0.183	0.233		
61			0.256	0.441				0.180	0.222
62			0.256	0.450				0.180	0.226
63			0.256	0.458				0.181	0.229
64			0.257	0.467				0.181	0.233
65			0.257	0.475				0.181	0.236

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EXHIBIT D MOBILE 6.2 Emission Factors for All Type Vehicle

	2010(gr/mi)		2017(gr/mi)		2026(gr/mi)	
	Freeway	Arterial	Freeway	Arterial	Freeway	Arterial
Speed	CO		CO		CO	
2.5		29.784		21.471		19.223
3	27.043	26.675	19.651	19.435	17.618	17.429
4	23.157	22.788	17.106	16.891	15.375	15.186
5	20.825	20.456	15.580	15.364	14.029	13.840
6	19.179	18.926	14.473	14.330	13.050	12.924
7	17.959	17.833	13.639	13.591	12.309	12.270
8	17.044	17.013	13.013	13.037	11.753	11.779
9	16.333	16.376	12.526	12.606	11.321	11.397
10	15.763	15.866	12.136	12.261	10.975	11.092
11	15.314	15.467	11.825	11.981	10.699	10.843
12	14.963	15.136	11.577	11.747	10.478	10.635
13	14.666	14.855	11.367	11.549	10.291	10.459
14	14.411	14.614	11.186	11.380	10.131	10.309
15	14.191	14.406	11.030	11.233	9.992	10.178
16	14.025	14.217	10.914	11.100	9.889	10.060
17	13.943	14.050	10.861	10.982	9.842	9.955
18	13.871	13.901	10.813	10.878	9.801	9.863
19	13.805	13.769	10.770	10.784	9.763	9.780
20	13.747	13.649	10.732	10.700	9.730	9.705
21	13.694	13.548	10.696	10.627	9.699	9.639
22	13.644	13.457	10.664	10.561	9.671	9.580
23	13.600	13.373	10.635	10.500	9.645	9.526
24	13.558	13.297	10.608	10.445	9.622	9.476
25	13.521	13.226	10.583	10.394	9.600	9.430
26	13.486	13.185	10.560	10.367	9.580	9.407
27	13.454	13.147	10.539	10.343	9.562	9.386
28	13.425	13.111	10.520	10.320	9.545	9.367
29	13.397	13.078	10.502	10.299	9.530	9.349
30	13.372	13.047	10.485	10.279	9.515	9.332
31	13.369	13.053	10.483	10.283	9.514	9.336
32	13.376	13.059	10.488	10.287	9.518	9.339
33	13.383	13.064	10.493	10.291	9.522	9.343
34	13.389	13.069	10.497	10.294	9.526	9.346
35	13.397	13.074	10.503	10.298	9.531	9.349
36	13.474	13.150	10.563	10.358	9.586	9.404
37	13.546	13.223	10.619	10.414	9.639	9.457
38	13.615	13.291	10.673	10.468	9.688	9.506
39	13.680	13.357	10.723	10.518	9.735	9.553
40	13.752	13.418	10.780	10.567	9.787	9.597
41	13.831	13.497	10.841	10.628	9.843	9.654
42	13.906	13.572	10.900	10.687	9.897	9.708
43	13.978	13.644	10.955	10.743	9.949	9.759
44	14.047	13.712	11.010	10.796	9.999	9.808
45	14.132	13.778	11.076	10.847	10.060	9.855
46	14.213	13.859	11.139	10.910	10.118	9.914
47	14.290	13.936	11.199	10.970	10.174	9.969
48	14.365	14.011	11.257	11.028	10.227	10.023
49	14.450	14.082	11.324	11.084	10.288	10.074
50	14.537	14.150	11.391	11.137	10.351	10.123
51	14.620	14.234	11.456	11.202	10.411	10.183
52	14.700	14.314	11.519	11.265	10.468	10.241
53	14.790	14.391	11.589	11.325	10.533	10.297
54	14.889	14.466	11.667	11.383	10.606	10.350
55	14.985	14.537	11.743	11.439	10.676	10.402
56	15.077	14.630	11.816	11.512	10.744	10.469
57	15.173	14.719	11.891	11.582	10.814	10.534
58	15.280	14.804	11.975	11.650	10.892	10.597
59	15.383	14.887	12.057	11.715	10.968	10.658
60	15.482	14.968	12.135	11.779	11.041	10.717
60.7	15.550		12.189		11.091	
61		15.064		11.855		10.788
62		15.157		11.928		10.856
63		15.248		11.999		10.922
64		15.335		12.068		10.987
65		15.420		12.135		11.049

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EXHIBIT D MOBILE 6.2 Emission Factors For Light Duty Vehicle

	2002(gr/mi)				2007(gr/mi)				2009(gr/mi)			
	Freeway		Arterial		Freeway		Arterial		Freeway		Arterial	
Speed	VOC	NOx	VOC	Nox	VOC	Nox	VOC	NOx	VOC	NOx	VOC	NOx
2.5			8.253	2.425			5.287	1.372			4.164	1.101
3	6.780	2.284	6.601	2.315	4.309	1.289	4.181	1.310	3.398	1.033	3.299	1.050
4	4.714	2.146	4.535	2.176	2.928	1.210	2.800	1.231	2.317	0.970	2.218	0.988
5	3.475	2.063	3.295	2.094	2.099	1.163	1.972	1.184	1.669	0.933	1.570	0.950
6	2.849	1.915	2.831	1.957	1.696	1.077	1.685	1.105	1.353	0.863	1.345	0.887
7	2.501	1.763	2.499	1.860	1.482	0.988	1.480	1.049	1.184	0.792	1.185	0.842
8	2.241	1.649	2.250	1.786	1.323	0.921	1.326	1.007	1.058	0.738	1.063	0.808
9	2.038	1.559	2.056	1.729	1.198	0.870	1.207	0.974	0.961	0.696	0.970	0.782
10	1.876	1.489	1.901	1.683	1.098	0.828	1.111	0.948	0.882	0.662	0.895	0.761
11	1.754	1.421	1.803	1.616	1.025	0.789	1.054	0.908	0.825	0.631	0.849	0.729
12	1.669	1.353	1.721	1.559	0.976	0.749	1.006	0.876	0.785	0.598	0.811	0.702
13	1.597	1.295	1.651	1.512	0.933	0.715	0.965	0.848	0.752	0.571	0.779	0.680
14	1.535	1.245	1.591	1.470	0.898	0.686	0.930	0.824	0.723	0.548	0.752	0.661
15	1.481	1.202	1.539	1.435	0.866	0.660	0.900	0.803	0.698	0.527	0.728	0.644
16	1.436	1.175	1.491	1.403	0.840	0.645	0.872	0.785	0.677	0.515	0.705	0.629
17	1.403	1.176	1.449	1.375	0.820	0.646	0.847	0.769	0.662	0.516	0.685	0.616
18	1.374	1.177	1.411	1.350	0.803	0.647	0.825	0.754	0.648	0.517	0.668	0.605
19	1.347	1.179	1.378	1.327	0.787	0.648	0.805	0.741	0.636	0.518	0.652	0.594
20	1.323	1.179	1.347	1.307	0.772	0.649	0.787	0.729	0.625	0.519	0.638	0.585
21	1.303	1.179	1.322	1.288	0.760	0.650	0.773	0.719	0.615	0.520	0.626	0.576
22	1.286	1.180	1.299	1.271	0.749	0.650	0.759	0.709	0.607	0.520	0.616	0.568
23	1.270	1.180	1.278	1.256	0.740	0.650	0.747	0.700	0.600	0.520	0.606	0.561
24	1.255	1.180	1.259	1.241	0.732	0.651	0.736	0.692	0.593	0.520	0.597	0.554
25	1.242	1.179	1.241	1.229	0.724	0.651	0.726	0.684	0.586	0.520	0.589	0.548
26	1.229	1.179	1.226	1.216	0.716	0.651	0.717	0.677	0.581	0.521	0.582	0.542
27	1.217	1.179	1.212	1.205	0.709	0.651	0.709	0.670	0.576	0.521	0.576	0.537
28	1.207	1.179	1.200	1.194	0.703	0.651	0.701	0.664	0.570	0.521	0.570	0.532
29	1.196	1.178	1.188	1.184	0.697	0.651	0.694	0.658	0.566	0.521	0.565	0.528
30	1.186	1.178	1.176	1.174	0.691	0.651	0.687	0.653	0.561	0.521	0.559	0.523
31	1.176	1.176	1.164	1.168	0.685	0.650	0.681	0.649	0.557	0.520	0.554	0.520
32	1.165	1.174	1.153	1.163	0.679	0.650	0.674	0.646	0.553	0.520	0.549	0.518
33	1.155	1.172	1.142	1.157	0.674	0.649	0.668	0.643	0.548	0.519	0.545	0.515
34	1.146	1.171	1.132	1.151	0.668	0.648	0.663	0.640	0.544	0.518	0.540	0.513
35	1.136	1.170	1.122	1.147	0.664	0.647	0.658	0.637	0.540	0.518	0.536	0.510
36	1.130	1.172	1.117	1.149	0.660	0.648	0.654	0.639	0.537	0.520	0.533	0.512
37	1.124	1.174	1.110	1.151	0.656	0.651	0.650	0.640	0.534	0.521	0.530	0.514
38	1.118	1.176	1.105	1.154	0.652	0.652	0.647	0.642	0.532	0.522	0.528	0.515
39	1.113	1.178	1.100	1.156	0.649	0.654	0.644	0.643	0.530	0.524	0.525	0.516
40	1.108	1.181	1.095	1.158	0.646	0.656	0.641	0.645	0.527	0.525	0.523	0.518
41	1.103	1.185	1.089	1.162	0.643	0.659	0.637	0.648	0.525	0.527	0.521	0.520
42	1.097	1.188	1.084	1.165	0.640	0.661	0.635	0.650	0.522	0.529	0.519	0.521
43	1.092	1.191	1.079	1.168	0.637	0.663	0.632	0.653	0.520	0.532	0.516	0.523
44	1.088	1.195	1.075	1.171	0.634	0.666	0.629	0.654	0.518	0.533	0.514	0.525
45	1.083	1.199	1.070	1.175	0.631	0.668	0.626	0.657	0.516	0.535	0.512	0.527
46	1.078	1.203	1.066	1.178	0.628	0.671	0.623	0.659	0.514	0.538	0.510	0.529
47	1.073	1.207	1.061	1.182	0.625	0.673	0.620	0.662	0.512	0.540	0.508	0.532
48	1.069	1.210	1.056	1.186	0.622	0.676	0.618	0.664	0.509	0.542	0.506	0.533
49	1.064	1.214	1.051	1.189	0.620	0.679	0.615	0.667	0.508	0.545	0.504	0.535
50	1.059	1.218	1.047	1.192	0.616	0.682	0.613	0.669	0.505	0.547	0.502	0.537
51	1.055	1.222	1.043	1.196	0.614	0.684	0.610	0.672	0.503	0.549	0.500	0.540
52	1.050	1.226	1.039	1.200	0.611	0.687	0.607	0.675	0.502	0.551	0.498	0.542
53	1.046	1.231	1.035	1.204	0.609	0.689	0.604	0.677	0.500	0.553	0.496	0.544
54	1.043	1.235	1.031	1.207	0.606	0.693	0.602	0.679	0.498	0.556	0.495	0.546
55	1.039	1.239	1.027	1.211	0.604	0.695	0.599	0.682	0.497	0.559	0.493	0.548
56	1.035	1.243	1.023	1.215	0.602	0.698	0.597	0.684	0.495	0.561	0.491	0.550
57	1.032	1.247	1.020	1.219	0.600	0.701	0.596	0.687	0.494	0.563	0.490	0.553
58	1.029	1.252	1.016	1.223	0.598	0.705	0.594	0.690	0.492	0.566	0.488	0.554
59	1.026	1.256	1.013	1.227	0.597	0.707	0.591	0.692	0.491	0.568	0.487	0.557
60	1.022	1.261	1.010	1.231	0.595	0.710	0.590	0.695	0.490	0.571	0.486	0.559
60.7	1.020	1.264			0.593	0.712			0.489	0.573		
61			1.007	1.234			0.588	0.697			0.485	0.561
62			1.004	1.239			0.587	0.700			0.483	0.563
63			1.001	1.243			0.585	0.703			0.482	0.566
64			0.999	1.246			0.583	0.705			0.482	0.568
65			0.996	1.250			0.582	0.708			0.480	0.570

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EXHIBIT D MOBILE 6.2 Emission Factors For Light Duty Vehicle

	2017(gr/mi)					2026(gr/mi)			
	Freeway		Arterial			Freeway		Arterial	
Speed	VOC	Nox	VOC	Nox		VOC	NOx	VOC	NOx
2.5			1.902	0.445				1.607	0.293
3	1.556	0.417	1.513	0.425		1.306	0.273	1.269	0.279
4	1.070	0.391	1.027	0.400		0.884	0.256	0.847	0.262
5	0.778	0.377	0.736	0.385		0.631	0.246	0.594	0.252
6	0.635	0.348	0.633	0.359		0.507	0.226	0.506	0.233
7	0.556	0.318	0.560	0.340		0.440	0.205	0.442	0.220
8	0.499	0.295	0.504	0.326		0.390	0.190	0.395	0.211
9	0.453	0.278	0.462	0.315		0.351	0.178	0.358	0.203
10	0.417	0.264	0.428	0.307		0.320	0.168	0.329	0.197
11	0.390	0.251	0.406	0.294		0.297	0.159	0.310	0.188
12	0.371	0.238	0.387	0.283		0.281	0.150	0.295	0.181
13	0.355	0.226	0.371	0.273		0.267	0.142	0.281	0.174
14	0.341	0.216	0.359	0.266		0.255	0.135	0.270	0.169
15	0.329	0.208	0.347	0.258		0.245	0.129	0.260	0.164
16	0.319	0.203	0.336	0.252		0.236	0.126	0.250	0.160
17	0.311	0.203	0.326	0.247		0.229	0.126	0.241	0.156
18	0.304	0.204	0.317	0.242		0.223	0.126	0.233	0.152
19	0.298	0.204	0.309	0.238		0.218	0.127	0.226	0.149
20	0.292	0.205	0.302	0.234		0.213	0.127	0.220	0.147
21	0.288	0.205	0.296	0.230		0.209	0.128	0.215	0.144
22	0.284	0.205	0.291	0.227		0.205	0.128	0.211	0.142
23	0.281	0.206	0.286	0.224		0.202	0.127	0.207	0.140
24	0.278	0.206	0.282	0.221		0.200	0.128	0.204	0.138
25	0.275	0.206	0.279	0.219		0.198	0.128	0.200	0.136
26	0.273	0.206	0.275	0.216		0.195	0.128	0.198	0.135
27	0.270	0.206	0.272	0.214		0.193	0.128	0.195	0.133
28	0.267	0.206	0.269	0.212		0.191	0.128	0.192	0.132
29	0.265	0.207	0.266	0.210		0.189	0.128	0.190	0.131
30	0.263	0.207	0.264	0.209		0.187	0.128	0.188	0.129
31	0.262	0.207	0.261	0.207		0.186	0.128	0.186	0.129
32	0.260	0.206	0.259	0.206		0.184	0.127	0.184	0.128
33	0.258	0.206	0.257	0.205		0.182	0.127	0.182	0.127
34	0.256	0.205	0.255	0.204		0.181	0.127	0.180	0.126
35	0.255	0.205	0.253	0.203		0.180	0.127	0.179	0.125
36	0.253	0.206	0.252	0.204		0.179	0.127	0.178	0.125
37	0.252	0.207	0.251	0.205		0.178	0.128	0.177	0.126
38	0.251	0.208	0.250	0.205		0.176	0.129	0.175	0.127
39	0.250	0.208	0.249	0.206		0.176	0.129	0.175	0.127
40	0.249	0.209	0.248	0.207		0.175	0.130	0.174	0.128
41	0.248	0.210	0.247	0.207		0.174	0.130	0.173	0.129
42	0.247	0.211	0.246	0.208		0.173	0.131	0.172	0.129
43	0.246	0.212	0.245	0.209		0.172	0.132	0.171	0.130
44	0.245	0.213	0.244	0.210		0.171	0.132	0.171	0.130
45	0.245	0.214	0.244	0.211		0.171	0.133	0.170	0.131
46	0.244	0.215	0.243	0.212		0.170	0.133	0.170	0.132
47	0.244	0.216	0.242	0.213		0.170	0.134	0.169	0.132
48	0.243	0.217	0.241	0.214		0.169	0.135	0.168	0.133
49	0.242	0.218	0.241	0.215		0.168	0.136	0.167	0.133
50	0.241	0.219	0.240	0.216		0.168	0.137	0.167	0.134
51	0.241	0.220	0.240	0.217		0.167	0.137	0.166	0.135
52	0.240	0.221	0.239	0.218		0.167	0.138	0.166	0.136
53	0.240	0.222	0.238	0.219		0.167	0.138	0.166	0.136
54	0.239	0.223	0.238	0.220		0.166	0.139	0.165	0.137
55	0.239	0.225	0.237	0.221		0.166	0.140	0.165	0.137
56	0.239	0.226	0.237	0.222		0.166	0.140	0.164	0.138
57	0.239	0.226	0.237	0.223		0.165	0.141	0.164	0.139
58	0.238	0.227	0.237	0.224		0.165	0.142	0.164	0.139
59	0.238	0.229	0.236	0.225		0.165	0.143	0.164	0.140
60	0.238	0.230	0.236	0.226		0.165	0.143	0.164	0.140
60.7	0.238	0.231				0.165	0.143		
61			0.236	0.226				0.163	0.141
62			0.236	0.228				0.163	0.142
63			0.235	0.229				0.163	0.142
64			0.235	0.230				0.163	0.143
65			0.235	0.231				0.163	0.144

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EXHIBIT D MOBILE 6.2 Emission Factors for Light Duty Vehicle on Arterial

	2010 (gr/mi)	2017 (gr/mi)	2026 (gr/mi)
	Arterial	Arterial	Arterial
Speed	CO	CO	CO
2.5	29.858	21.500	19.450
3	26.708	19.464	17.636
4	22.766	16.911	15.364
5	20.402	15.383	14.003
6	18.955	14.426	13.154
7	17.925	13.748	12.540
8	17.154	13.235	12.086
9	16.553	12.836	11.732
10	16.072	12.517	11.452
11	15.727	12.283	11.242
12	15.447	12.083	11.066
13	15.207	11.923	10.916
14	14.997	11.779	10.790
15	14.817	11.653	10.680
16	14.662	11.549	10.580
17	14.522	11.449	10.500
18	14.402	11.369	10.424
19	14.292	11.289	10.354
20	14.192	11.224	10.294
21	14.112	11.164	10.244
22	14.037	11.114	10.194
23	13.967	11.064	10.154
24	13.907	11.024	10.114
25	13.857	10.984	10.074
26	13.827	10.964	10.064
27	13.802	10.954	10.054
28	13.782	10.934	10.044
29	13.762	10.924	10.034
30	13.736	10.914	10.024
31	13.752	10.930	10.034
32	13.766	10.940	10.044
33	13.786	10.950	10.054
34	13.796	10.960	10.064
35	13.811	10.970	10.070
36	13.901	11.035	10.140
37	13.981	11.101	10.196
38	14.061	11.161	10.256
39	14.136	11.221	10.306
40	14.206	11.281	10.362
41	14.296	11.341	10.422
42	14.381	11.406	10.482
43	14.456	11.466	10.537
44	14.536	11.526	10.597
45	14.606	11.586	10.647
46	14.691	11.652	10.707
47	14.775	11.712	10.769
48	14.855	11.778	10.823
49	14.925	11.838	10.879
50	15.000	11.892	10.935
51	15.090	11.958	10.995
52	15.170	12.023	11.055
53	15.250	12.083	11.115
54	15.325	12.143	11.170
55	15.400	12.203	11.220
56	15.480	12.269	11.280
57	15.565	12.329	11.340
58	15.645	12.389	11.396
59	15.725	12.454	11.456
60	15.795	12.509	11.506
61	15.880	12.574	11.572
62	15.964	12.640	11.628
63	16.044	12.700	11.688
64	16.119	12.760	11.738
65	16.194	12.820	11.793

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EXHIBIT D MOBILE 6.2 Emission Factors for Bus on Arterial

	2010 (gr/mi)	2017 (gr/mi)	2026 (gr/mi)
	Arterial	Arterial	Arterial
Speed	CO	CO	CO
2.5	13.461	5.969	2.223
3	12.637	5.604	2.087
4	11.607	5.147	1.917
5	10.989	4.873	1.815
6	9.851	4.369	1.627
7	9.039	4.008	1.493
8	8.430	3.738	1.392
9	7.956	3.528	1.314
10	7.577	3.360	1.252
11	7.002	3.105	1.157
12	6.522	2.892	1.077
13	6.117	2.712	1.010
14	5.769	2.558	0.953
15	5.468	2.425	0.903
16	5.133	2.276	0.848
17	4.838	2.145	0.799
18	4.575	2.029	0.756
19	4.341	1.925	0.717
20	4.129	1.831	0.682
21	3.923	1.740	0.648
22	3.736	1.657	0.617
23	3.565	1.581	0.589
24	3.408	1.511	0.563
25	3.264	1.447	0.539
26	3.134	1.390	0.518
27	3.013	1.336	0.498
28	2.901	1.286	0.479
29	2.797	1.240	0.462
30	2.700	1.197	0.446
31	2.618	1.161	0.432
32	2.541	1.127	0.420
33	2.469	1.095	0.408
34	2.401	1.065	0.397
35	2.337	1.036	0.386
36	2.288	1.015	0.378
37	2.242	0.994	0.370
38	2.198	0.975	0.363
39	2.157	0.956	0.356
40	2.117	0.939	0.350
41	2.093	0.928	0.346
42	2.070	0.918	0.342
43	2.048	0.908	0.338
44	2.027	0.899	0.335
45	2.007	0.890	0.332
46	2.004	0.889	0.331
47	2.001	0.887	0.330
48	1.998	0.886	0.330
49	1.995	0.885	0.329
50	1.992	0.883	0.329
51	2.008	0.891	0.332
52	2.024	0.898	0.334
53	2.040	0.904	0.337
54	2.054	0.911	0.339
55	2.069	0.917	0.342
56	2.107	0.934	0.348
57	2.144	0.951	0.354
58	2.180	0.967	0.360
59	2.215	0.982	0.366
60	2.248	0.997	0.371
61	2.314	1.026	0.382
62	2.378	1.054	0.393
63	2.439	1.082	0.403
64	2.499	1.108	0.413
65	2.557	1.134	0.422

EXHIBIT E AIR QUALITY ANALYSIS EXEMPT CODES

Safety

E-1	Railroad/Highway Crossing
E-2	Hazard Elimination Program
E-3	Safer Non-Federal Aid System Roads
E-4	Shoulder Improvements
E-5	Increasing Sight Distance
E-6	Safety Improvement Program
E-7	Traffic Control Devices and Operating Assistance Other Than Signalization Projects
E-8	Railroad/Highway Crossing Warning Devices
E-9	Guardrails, Median Barriers, Crash Cushions
E-10	Pavement Resurfacing and/or Rehabilitation
E-11	Pavement Marking Demonstration
E-12	Emergency Relief (23 U.S.C. 125)
E-13	Fencing
E-14	Skid Treatments
E-15	Safety Roadside Rest Areas
E-16	Adding Medians
E-17	Truck Climbing Lanes outside the Urbanized Area
E-18	Lighting Improvements
E-19	Widening Narrow Pavements or Reconstructing Bridges (No Additional Travel Lanes)
E-20	Emergency Truck Pullovers

Mass Transit

E-21	Operating Assistance to Transit Agencies
E-22	Purchase of Support Vehicles
E-23	Rehabilitation of Transit Vehicles[1]
E-24	Purchase of Office, Shop, and Operating Equipment for Existing Facilities
E-25	Purchase of Operating Equipment for Vehicles (e.g., radios, fareboxes, lifts, etc.)
E-26	Construction or Renovation of Power, Signal and Communication Systems
E-27	Construction of Small Passenger Shelters and Information Kiosks
E-28	Reconstruction or Renovation of Transit Buildings and Structures
E-29	Rehabilitation or Reconstruction of Track Structures, Track, and Track Bed in Existing Rights –of-Way
E-30	Purchase of New Buses and Rail Cars to Replace Existing Vehicles or for Minor Expansion of the Fleet[1]
E-31	Construction of New Bus or Rail Storage/Maintenance Facilities Categorically Excluded in 23 CFR Part 771

Air Quality

E-32	Continuation of Ride Sharing and Van Pooling Promotion Activities at Current Levels
E-33	Bicycle and Pedestrian Facilities

Other

Specific Activities Which Do Not Involve or Lead Directly to Construction, Such As:

E-34	Planning and Technical Studies
E-35	Grants for Training and Research Programs
E-36	Planning Activities Conducted Pursuant to Titles 23 and 49 U.S.C.
E-37	Federal Aid Systems Revisions
E-38	Engineering to Assess Social, Economic and Environmental Effects of the Proposed Action or Alternatives to That Action
E-39	Noise Attenuation
E-40	Advance Land Acquisitions (23 CFR part 712 or 23 CFR part 771)
E-41	Acquisition of Scenic Easements
E-42	Planting, Landscaping, etc.
E-43	Sign Removal
E-44	Directional and Informational Signs
E-45	Transportation Enhancement Activities (Except Rehabilitation and Operation of Historic Transportation Buildings, Structures or Facilities)
E-46	Repair of Damage Caused by Natural Disasters, Civil Unrest, or Terrorist Acts, Except Projects Involving Substantial Functional, Locational or Capacity Changes
ATT	Project is Located in Attainment Area and, therefore, Not Subject to Conformity

PROJECTS EXEMPT FROM REGIONAL EMISSION ANALYSIS

E-51	Intersection Channelization Projects
E-52	Intersection Signalization Projects at Individual Intersections
E-53	Interchange Reconfiguration Projects
E-54	Changes in Vertical and Horizontal Alignment
E-55	Truck Size and Weight Inspection Stations
E-56	Bus Terminals and Transfer Points

OTHER EXEMPT CODES

N/E	Project is Not-Exempt

[1] PM10 non-attainment and maintenance areas, such projects are exempt only if they are in compliance with control measures
in the applicable implementation plan

EXHIBIT F

AIR QUALITY ANALYSIS FOR MANCHESTER PARK AND RIDE USING M6.2 FACTORS

Description: Construct 600 Spaces Park and Ride structure with intermodal transportation center and rail platform on a five-acre site in Manchester

PROJECT LOCATION:	MANCHESTER					
PROJECT DESCRIPTION:	600 SPACE PARK AND RIDE					
MPO:	SOUTHERN NH RPC		NONATTAINMENT AREA:			
OPEN TO TRAFFIC:	BY 2018					
STREET NAME:						
LOCATION:						
PROPOSED SIZE:	600	SPACES				
GROWTH RATE:	0.00%					
					2026	**2026**
TRAFFIC					NO BUILD	BUILD
AADT:					0	540
SUMMER ADT:					0	540
AVERAGE SPEED:					55	55
LENGTH (MILES)*:						40
					2026	**2026**
MOBILE6.2					NO BUILD	BUILD
EMISSION FACTORS						
HC (gm/mi)						0.166
CO (gm/mi)						11.490
NOx (gm/mi)						0.140
[SUMMER ADT*LENGTH*(gm/mi)]/1000=					**2026**	**2026**
TOTAL EMISSIONS					NO BUILD	BUILD
HC (kgs/day)						3.59
CO (kgs/day)						248.19
NOx (kgs/day)						3.02
DIFFERENCES (BUILD-NO BUILD)						
HC (kgs/day)				-		3.59
CO (kgs/day)				0.00		248.19
NOx (kgs/day)				-		3.02

ASSUMPTIONS:

1. The first Ozone analysis year is assumed to be 2026. it is being assumed that 90% of the full capacity would be utilized.
2. Assuming a 90% usage of the lot in the 2026 amounts to 540 trips.
3. Based on the number of commuting residents commuting out of Manchester area, it appears that parking lot usage of 90% in the year 2026.
4. It is being assumed conservatively that each trip will be traveling 20 miles each way, making it a total of 40 miles two-way. Looking at the destinations, this number is low and will take care of the positive VMT added by the cars driving to the park-n-ride lot.
5. Looking at the routes that the traffic will be following, an average speed of 55 mph is being assumed.
6. The HC and NOx factors are for Summer and CO factors are for Winter
7. The procedure for the above analysis is developed by the NHDOT.
8. The analysis is done using the Mobile 6.2 Emission Factors (for LDVs).

South Manchester Rail Trail CMAQ Grant Application
Air Quality Analysis (Emission Credits) using MOBILE6.2 factors

It is estimated that approximately 760 Vehicle Miles of Travel (VMT) per day will be removed from the surrounding roadways as a result of this project (source: VHB analysis). Southern New Hampshire Planning Commission's (SNHPC) Regional Travel Demand Model was used to determine the travel speeds on the project's capture area roadways. The results show that the average travel speed on these roadways is approximately 30 miles per hour.

Emission values are calculated by multiplying VMT values with emission factors for an average speed (Equation 1). LDV Emission values were obtained from New Hampshire Department of Environmental Services' (NHDES) analysis of MOBILE 6.2 Emission model and are as follows (Table 1) for all the existing air quality conformity analysis years.

Emission (kg/day) = VMT * Emission Factor (gm/mile)/1000 ……… (Eq 1)

TABLE 1: Emission Factors for HC and NOx (gm/mile)

2007	2009	2017	2026
HC = 0.687	HC = 0.559	HC=0.264	HC=0.188
NOX = 0.653	NOX = 0.523	NOX=0.209	NOX=0.130

* Note: The above emission factors are for a speed of 30 mph for LDV
HC=Hydro Carbon, NOx = Nitrogen Oxide

TABLE 2: Emission Factors for CO (gm/mile)

2010	2017	2026
HC = 0.559	HC=0.264	HC=0.188
NOX = 0.523	NOX=0.209	NOX=0.130

Table 2 below shows the results of the emission savings due to this project. Please note that even for all the future analysis years, the reduction in VMTs are kept constant for conservative analysis.

TABLE 2: Emission Analysis

YEAR	VMT REDUCTION	EMISSION REDUCTION	
		HC (kgs/day)	NOX (kgs/day)
2007	760	0.52	0.50
2009	760	0.42	0.40
2017	760	0.20	0.16
2026	760	0.14	0.10

As this project will have limited use during the winter months, no CO analysis (for winter months) for City of Manchester is performed and no CO credit is taken.

Pillsbury Road/Mammoth Road Sidewalk Project CMAQ Grant Application
Air Quality Analysis (Emission Credits) using MOBILE6.2 Factors

It is estimated that approximately 53 Vehicle Miles of Travel (VMT) per day will be removed from the surrounding roadways as a result of this project (source: Town of Londonderry analysis). Southern New Hampshire Planning Commission's (SNHPC) Regional Travel Demand Model was used to determine the travel speeds on the project's capture area roadways. The results show that the average travel speed on these roadways is approximately 30 miles per hour.

Emission values are calculated by multiplying VMT values with emission factors for an average speed (Equation 1). LDV Emission values were obtained from New Hampshire Department of Environmental Services' (NHDES) analysis of MOBILE 6.2 Emission model and are as follows (Table 1) for all the existing air quality conformity analysis years.

Emission (kgs/day) = VMT * Emission Factor (gm/mile)/1000 ....(Eq 1)

TABLE 1: Emission Factors (gm/mile)

2007	2009	2017	2026
HC = 0.687	HC = 0.559	HC=0.264	HC=0.188
NOX = 0.653	NOX = 0.523	NOX=0.209	NOX=0.130

Source: NHDES
* Note: The above emission factors are for a speed of 30 mph for LDVs
HC=Hydro Carbon, NOx = Nitrogen Oxide

Table 2 below shows the results of the emission savings due to this project. Please note that even for all the future analysis years, the reduction in VMTs are kept constant for conservative analysis.

TABLE 2: Emission Analysis

YEAR	VMT REDUCTION	EMISSION REDUCTION	
		HC (kgs/day)	NOX (kgs/day)
2007	53	0.036	0.035
2009	53	0.030	0.028
2017	53	0.014	0.011
2026	53	0.010	0.007

Source: SNHPC Analysis

Hooksett US 3 / NH 28 Signal Coordination Project
State Project #12537

US 3/NH 28 - INTERSECTION IMPROVEMENTS @ NH 28 BYPASS AND OPTIMIZE SIGNAL SYSTEMS FROM NH 28 BYPASS TO LEGENDS DRIVE [98-20CM]

The following analysis is performed by the NHDOT (Using Mobile 6.2 Emission Factors)

Summary

Scenario	Emissions VOC kg/day	Emissions NOx kg/day
2007 No-Build	6.42	9.32
2007 Build	5.42	8.96
Reduction	1.00	0.36
2009 No-Build	5.44	7.76
2009 Build	4.62	7.45
Reduction	0.83	0.31
2017 No-Build	2.58	2.84
2017 Build	2.21	2.72
Reduction	0.37	0.11
2026 No-Build	2.24	1.77
2026 Build	1.88	1.69
Reduction	0.36	0.08

Analysis data is from SNHPC traffic model

No-build refers to "no signal coordination project"

Assume that building this project increases the average speed by 1 mph and decreases the total delay by 10 seconds per vehicle.

2007 No-Build

Section	Length (miles)	Speed (mph)	Model Volume (daily)	VMT	Emission Factors VOC g/mile	Emission Factors NOx g/mile	Emissions VOC kg/day	Emissions NOx kg/day
NH 28 Bypass - GS Marketplace	0.175	35	28617	5008	0.671	1.097	3.36	5.49
GS Marketplace - Legends Dr	0.13	35	24038	3125	0.671	1.097	2.10	3.43
	0.305		26665				5.46	8.92
	Time(sec)							
Delay (more than build)	10	2.5	26665		5.197	2.156	0.96	0.40
						Total	6.42	9.32

2007 Build

Section	Length (miles)	Speed (mph)	Model Volume (daily)	VMT	Emission Factors VOC g/mile	Emission Factors NOx g/mile	Emissions VOC kg/day	Emissions NOx kg/day
NH 28 Bypass - GS Marketplace	0.175	36	28617	5008	0.666	1.102	3.34	5.52
GS Marketplace - Legends Dr	0.13	36	24038	3125	0.666	1.102	2.08	3.44
	0.305		26665			**Total**	5.42	8.96

2009 No-Build

			Model		Emission Factors		Emissions	
Section	Length	Speed	Volume	VMT	VOC	NOx	VOC	NOx
	(miles)	(mph)	(daily)		g/mile	g/mile	kg/day	kg/day
NH 28 Bypass - GS Marketplace	0.175	35	29600	5180	0.552	0.882	2.86	4.57
GS Marketplace - Legends Dr	0.13	35	24936	3242	0.552	0.882	1.79	2.86
	0.305		27612				4.65	7.43
	Time(sec)							
Delay (more than build)	10	2.5	27612		4.142	1.735	0.79	0.33
						Total	5.44	7.76

2009 Build

			Model		Emission Factors		Emissions	
Section	Length	Speed	Volume	VMT	VOC	NOx	VOC	NOx
	(miles)	(mph)	(daily)		g/mile	g/mile	kg/day	kg/day
NH 28 Bypass - GS Marketplace	0.175	36	29600	5180	0.548	0.885	2.84	4.58
GS Marketplace - Legends Dr	0.13	36	24936	3242	0.548	0.885	1.78	2.87
	0.305		27612			**Total**	4.62	7.45

2017 No-Build

			Estimated		Emission Factors		Emissions	
Section	Length	Speed	Volume	VMT	VOC	NOx	VOC	NOx
	(miles)	(mph)	(daily)		g/mile	g/mile	kg/day	kg/day
NH 28 Bypass - GS Marketplace	0.175	35	27856	4875	0.278	0.340	1.36	1.66
GS Marketplace - Legends Dr	0.13	35	23958	3115	0.278	0.340	0.87	1.06
	0.305		26195				2.22	2.72
	Time(sec)							
Delay (more than build)	10	2.5	26195		1.961	0.671	0.36	0.12
						Total	2.58	2.84

2017 Build

			Estimated		Emission Factors		Emissions	
Section	Length	Speed	Volume	VMT	VOC	NOx	VOC	NOx
	(miles)	(mph)	(daily)		g/mile	g/mile	kg/day	kg/day
NH 28 Bypass - GS Marketplace	0.175	36	27856	4875	0.276	0.341	1.35	1.66
GS Marketplace - Legends Dr	0.13	36	23958	3115	0.276	0.341	0.86	1.06
	0.305		26195			**Total**	2.21	2.72

2026 No-Build

			Estimated		Emission Factors		Emissions	
Section	Length	Speed	Volume	VMT	VOC	NOx	VOC	NOx
	(miles)	(mph)	(daily)		g/mile	g/mile	kg/day	kg/day
NH 28 Bypass - GS Marketplace	0.175	35	33209	5812	0.198	0.177	1.15	1.03
GS Marketplace - Legends Dr	0.13	35	28570	3714	0.198	0.177	0.74	0.66
	0.305		31232				1.89	1.69
	Time(sec)							
Delay (more than build)	10	2.5	31232		1.633	0.374	0.35	0.08
						Total	2.24	1.77

2026 Build

			Estimated		Emission Factors		Emissions	
Section	Length	Speed	Volume	VMT	VOC	NOx	VOC	NOx
	(miles)	(mph)	(daily)		g/mile	g/mile	kg/day	kg/day
NH 28 Bypass - GS Marketplace	0.175	36	33209	5812	0.197	0.177	1.14	1.03
GS Marketplace - Legends Dr	0.13	36	28570	3714	0.197	0.177	0.73	0.66
	0.305		31232			**Total**	1.88	1.69

Sample Calculations
2026 Build VOC for NH 28 Bypass to GS Marketplace
VMT = .175 miles * 33209 veh/day = 5812 veh-miles/day
VOC = (5812 veh-miles/day * 0.197 g/veh-mile)/(1000g/kg) = 1.14 kg/day
Delay for 2026 No-Build
Average Volume for project is the weighted average of the sections
Delay VOC = (31232 veh/day * 10 sec/veh * 1.633 g/mile * 2.5 mile/hr) / (3600 sec/hr * 1000 g/kg) = 0.35 kg/day

Londonderry NH 102 Signal Coordination Project
State #13116

INSTALLATION OF COORDINATED TRAFFIC SIGNAL SYSTEM FROM I-93, EXIT 4 WESTERLY TO NH 128 [98-19CM]

Summary

The following analysis is done by the NHDOT Using Mobile 6.2 Emission Factors

Scenario	Emissions VOC kg/day	Emissions NOx kg/day
2007 No-Build	27.446	42.938
2007 Build	26.399	42.584
Reduction	1.047	0.354
2009 No-Build	23.331	35.720
2009 Build	22.476	35.416
Reduction	0.855	0.304
2017 No-Build	11.918	14.021
2017 Build	11.501	13.903
Reduction	0.417	0.117
2026 No-Build	9.791	8.354
2026 Build	9.420	8.257
Reduction	0.371	0.097

Analysis data is from SNHPC traffic model
No-build refers to "no signal coordination project"
Assume that building this project increases the average speed by 1 mph and decreases the total delay by 10 seconds per vehicle.

Calculations

2007 No-Build

Section	Length (miles)	Speed (mph)	Model Volume (daily)	VMT	Emission Factors VOC g/mile	Emission Factors NOx g/mile	Emissions VOC kg/day	Emissions NOx kg/day
NH 128 - Buttrick Rd.	0.8	35	17130	13704	0.671	1.097	9.20	15.03
Buttrick D - Gilcrest Rd	0.68	30	20265	13780	0.705	1.113	9.72	15.34
Gilcrest Rd - I93 SB on Ramp	0.3	30	36670	11001	0.705	1.113	7.76	12.24
	1.78		21621				26.67	42.61
	Time(sec)							
Delay (more than build)	10	2.5	21621		5.197	2.156	0.78	0.32
						Total	27.45	42.94

2007 Build

Section	Length (miles)	Speed (mph)	Model Volume (daily)	VMT	Emission Factors VOC g/mile	Emission Factors NOx g/mile	Emissions VOC kg/day	Emissions NOx kg/day
NH 128 - Buttrick Rd.	0.8	36	17130	13704	0.666	1.102	9.13	15.10
Buttrick D - Gilcrest Rd	0.68	31	20265	13780	0.697	1.109	9.60	15.28
Gilcrest Rd - I93 SB on Ramp	0.3	31	36670	11001	0.697	1.109	7.67	12.20
	1.78		21621			**Total**	26.40	42.58

2009 No-Build			Model		Emission Factors		Emissions	
Section	Length	Speed	Volume	VMT	VOC	NOx	VOC	NOx
	(miles)	(mph)	(daily)		g/mile	g/mile	kg/day	kg/day
NH 128 - Buttrick Rd.	0.8	35	17730	14184	0.552	0.882	7.83	12.51
Buttrick D - Gilcrest Rd	0.68	30	21000	14280	0.579	0.894	8.27	12.77
Gilcrest Rd - I93 SB on Ramp	0.3	30	37933	11380	0.579	0.894	6.59	10.17
	1.78		22384				22.69	35.45
	Time(sec)							
Delay (more than build)	10	2.5	22384		4.142	1.735	0.64	0.27
						Total	23.33	35.72

2009 Build								
			Model		Emission Factors		Emissions	
Section	Length	Speed	Volume	VMT	VOC	NOx	VOC	NOx
	(miles)	(mph)	(daily)		g/mile	g/mile	kg/day	kg/day
NH 128 - Buttrick Rd.	0.8	36	17730	14184	0.548	0.885	7.77	12.55
Buttrick D - Gilcrest Rd	0.68	31	21000	14280	0.573	0.891	8.18	12.72
Gilcrest Rd - I93 SB on Ramp	0.3	31	37933	11380	0.573	0.891	6.52	10.14
	1.78		22384			**Total**	22.48	35.42

2017 No-Build			Model		Emission Factors		Emissions	
Section	Length	Speed	Volume	VMT	VOC	NOx	VOC	NOx
	(miles)	(mph)	(daily)		g/mile	g/mile	kg/day	kg/day
NH 128 - Buttrick Rd.	0.8	35	18379	14703	0.278	0.34	4.09	5.00
Buttrick D - Gilcrest Rd	0.68	30	21661	14729	0.291	0.345	4.29	5.08
Gilcrest Rd - I93 SB on Ramp	0.3	30	37042	11113	0.291	0.345	3.23	3.83
	1.78		22778				11.61	13.91
	Time(sec)							
Delay (more than build)	10	2.5	22778		1.961	0.671	0.31	0.11
						Total	11.92	14.02

2017 Build								
			Model		Emission Factors		Emissions	
Section	Length	Speed	Volume	VMT	VOC	NOx	VOC	NOx
	(miles)	(mph)	(daily)		g/mile	g/mile	kg/day	kg/day
NH 128 - Buttrick Rd.	0.8	36	18379	14703	0.276	0.341	4.06	5.01
Buttrick D - Gilcrest Rd	0.68	31	21661	14729	0.288	0.344	4.24	5.07
Gilcrest Rd - I93 SB on Ramp	0.3	31	37042	11113	0.288	0.344	3.20	3.82
	1.78		22778			**Total**	11.50	13.90

2026 No-Build			Estimated		Emission Factors		Emissions	
Section	Length	Speed	Volume	VMT	VOC	NOx	VOC	NOx
	(miles)	(mph)	(daily)		g/mile	g/mile	kg/day	kg/day
NH 128 - Buttrick Rd.	0.8	35	20929	16743	0.198	0.177	3.32	2.96
Buttrick D - Gilcrest Rd	0.68	30	24922	16947	0.209	0.18	3.54	3.05
Gilcrest Rd - I93 SB on Ramp	0.3	30	42087	12626	0.209	0.18	2.64	2.27
	1.78		26020				9.50	8.29
	Time(sec)							
Delay (more than build)	10	2.5	26020		1.633	0.374	0.30	0.07
						Total	9.79	8.35

2026 Build								
			Estimated		Emission Factors		Emissions	
Section	Length	Speed	Volume	VMT	VOC	NOx	VOC	NOx
	(miles)	(mph)	(daily)		g/mile	g/mile	kg/day	kg/day
NH 128 - Buttrick Rd.	0.8	36	20929	16743	0.197	0.177	3.30	2.96
Buttrick D - Gilcrest Rd	0.68	31	24922	16947	0.207	0.179	3.51	3.03
Gilcrest Rd - I93 SB on Ramp	0.3	31	42087	12626	0.207	0.179	2.61	2.26
	1.78		26020			**Total**	9.42	8.26

Sample Calculations

2026 Build VOC for NH 128 to Buttrick Rd Section
VMT = 0.80 miles * 20929 veh/day = 16743 veh-miles/day
VOC = (16743 veh-miles/day * 0.197 g/veh-mile)/(1000g/kg) = 3.30 kg/day
Delay for 2026 No-Build
Average Volume for project is the weighted average of the sections
Delay VOC = (26020 veh/day * 10 sec/veh * 1.633 g/mile * 2.5 mile/hr) / (3600 sec/hr * 1000 g/kg) = 0.30 kg/day

I-93 ITS Project #10418Z

Benefits from the Transportation Management Center (TMC) CMAQ project are related to the benefits for this project, but the benefits from the previous CMAQ project were only taken on the I-95 corridor. There is no double-counting benefits from the TMC CMAQ project and this project.

From FHWA Resource Center, AIR QUALITY TEAM
Off-Model Air Quality Analysis: A Compendium of Practice
http://www.fhwa.dot.gov/resourcecenter/teams/airquality/pubs2.cfm

The main goal of an Incident Management Program is to reduce congestion by removing vehicles which are debilitated, injured or just broke. Nonrecurring Congestion is the effect these vehicles have on the main line flow. Excess freeway emission are caused by this type of congestion. This analysis provides the basis for calculation of reduction of VOCs due to these programs; however, NOx can be analyzed in a similar

Since we do not have traffic model outputs for emissions, we take the link emissions:

Link emissions = link length * link AADT * emissions for average link speed.

Note: 4.9 Percent of Freeway Emissions are Caused by Nonrecurring Congestion.

Non-recurrent emissions = link emissions * 0.049

Project benefit = Non-recurrent emissions * effectiveness

Project Effectiveness = 50% for Incident Detection and Response,
25% for Motorist Assistance, and 15% for Surveillance.
<u>Use 90% effectiveness</u>

We use data from our Anchor Sections (GIS) layer to get AADTs on I-93.
Assume average speed >= 60.7 mph

All emission factors are in grams per mile.
Last updated May 23,2006 by Becky Ohler

Speed	VOC	NOx	Road	Year
60.7	0.602	1.588	Freeway	2007
60.7	0.501	1.275	Freeway	2009
60.7	0.26	0.477	Freeway	2017
60.7	0.183	0.233	Freeway	2026

I-93 VMTs and Non Recurrent emissions:

	2007 VOC	2007 NOx	2009 VOC	2009 NOx	2017 VOC	2017 NOx	2026 VOC	2026 NOx
HOOKSETT	11.27	29.72	9.57	24.34	5.38	9.86	4.14	5.27
LONDONDERRY	13.52	35.66	11.48	29.21	6.45	11.83	4.97	6.32
MANCHESTER	16.97	44.76	14.40	36.66	8.09	14.85	6.23	7.93
TOTAL	41.75	110.14	35.45	90.21	19.92	36.55	15.33	19.52

I-93 VMTs emissions benefit (= non-recurrent emissions * 0.9):

I-93 VMTs emissions benefit (= non-recurrent emissions * 0.9):

	2007 VOC	2007 NOx	2009 VOC	2009 NOx	2017 VOC	2017 NOx	2026 VOC	2026 NOx
HOOKSETT	10.14	26.75	8.61	21.91	4.84	8.88	3.72	4.74
LONDONDERRY	12.17	32.10	10.33	26.29	5.81	10.65	4.47	5.69
MANCHESTER	15.27	40.28	12.96	32.99	7.29	13.37	5.61	7.14
TOTAL	37.58	99.13	31.90	81.19	17.93	32.89	13.80	17.57

I-93 ITS Project # 10418Z

CO Analysis for Manchester
Benefits from the Transportation Management Center (TMC) CMAQ project are related to the benefits for this project, but the benefits from the previous CMAQ project were only taken on the I-95 corridor. There is no double-counting benefits from the TMC CMAQ project and this project.

From FHWA Resource Center, AIR QUALITY TEAM
Off-Model Air Quality Analysis: A Compendium of Practice
http://www.fhwa.dot.gov/resourcecenter/teams/airquality/pubs2.cfm

The main goal of an Incident Management Program is to reduce congestion by removing vehicles which are debilitated, injured or just broke. Nonrecurring Congestion is the effect these vehicles have on the main line flow. Excess freeway emission are caused by this type of congestion.

Since we do not have traffic model outputs for emissions, we take the link emissions:

Link emissions = link length * link AADT * emissions for average link speed.

Note: 4.9 Percent of Freeway Emissions are Caused by Nonrecurring Congestion.

Non-recurrent emissions = link emissions * 0.049

Project benefit = Non-recurrent emissions * effectiveness

Project Effectiveness = 50% for Incident Detection and Response,
25% for Motorist Assistance, and 15% for Surveillance.
<u>Use 90% effectiveness</u>

We use data from our Anchor Sections (GIS) layer to get AADTs on I-93.
Assume average speed >= 60.7 mph

A winter time adjustment factor of 0.91 is used for CO analysis.

Emission factors provided by NH DES May 23, 2006 for Air Quality Analysis.
All emission factors are in grams per mile.

Speed	CO (gr/mi)	Road	Year
60.7	15.55	Freeway	2010
60.7	12.189	Freeway	2017
60.7	11.091	Freeway	2026

I-93 VMTs and Non Recurrent emissions:

	2010 CO	2017 CO	2026 CO
	Kg/day	Kg/day	Kg/day
MANCHESTER	410.90	345.32	343.65

I-93 VMTs emissions benefit (= non-recurrent emissions * 0.9):

	2010 CO	2017 CO	2026 CO
	Kg/day	Kg/day	Kg/day
MANCHESTER	369.81	310.79	309.29

Manchester Transit Authority
Project # 06-12CM
MTA Service Extension CMAQ Grant Application Air Quality Analysis

It is estimated that approximately 275 Vehicle Miles of Travel (VMT) per day will be removed from surrounding roadways through decreased use of
private vehicles resulting from this project (Source :MTA). The Southern New Hampshire Planning Commission (SNHPC) regional travel demand was
used to determine 28 miles per hour (MPH).

Emissions for VMTs saved by the project are calculated by multiplying VMT values with emission factors for an average speed (equation 1). Light-duty vehicle
emissions factors were obtained from the New Hampshire Department of
Enviromental Services (NHDES) for use in this analysis.

Emission (Kg/day)=VMT* Emission Factor (gm/mile)/1000 (Eq 1)

It is Estimated that the project will result in total bus mileage of approximately 204 miles per day.
Emissions for buses are calculated using Bus emmission factors obtained from NHDES.
The total emission savings for the project are calculated by subtracting the bus emissions from the emission savings created by the VMT removed from the surrounding roadways.

Emission savings(kg/day)= Emissions savings - Bus Emissions

A winter time adjustment factor of 0.91 is used for CO analysis.

Part One VOC and NOx Analysis
Emission Factors

	LDV (gr/ml)		Ml/hr	Bus(gr/ml)	
Year	VOC	NOx	Speed	VOC	NOx
2009	0.570	0.532	28	0.440	10.905
2017	0.269	0.212	28	0.271	4.259
2026	0.192	0.132	28	0.253	1.389

	LDV(Mile)	BUS(Mile)
VMT	275	204

Emission

	LDV (Kg)		Bus (Kg)		Credits (Kg)	
Year	VOC	NOx	VOC	NOx	VOC	NOx
2009	0.157	0.146	0.090	2.225	0.067	-2.078
2017	0.074	0.058	0.055	0.869	0.019	-0.810
2026	0.053	0.036	0.052	0.283	0.001	-0.247

Part Two Manchester CO Analysis

Emission Factors

	LDV(gr/ml)	Ml/hr	Bus(gr/ml)
Year	CO	Speed	CO
2010	13.782	28	2.901
2017	11.159	28	1.286

2026	10.04424	28	0.479

Emissions

	LDV (Kg)	Bus (Kg)	Credits (Kg)
Year	CO	CO	CO
2010	3.449	0.539	2.910
2017	2.792	0.239	2.554
2026	2.514	0.089	2.425

Appendix D
SEACOAST MPO and Salem-Plaistow-Windham MPO Report

AIR QUALITY CONFORMITY ANALYSIS

SEACOAST NH SERIOUS NON-ATTAINMENT AREA

SOUTHERN NH SERIOUS NON-ATTAINMENT AREA
(RPC PORTION)

MANCHESTER MARGINAL NON-ATTAINMENT AREA
(SEACOAST MPO PORTION)

FOR:

- SEACOAST MPO 2007-2010 TRANSPORTATION IMPROVEMENT PROGRAM
- SEACOAST MPO 2007-2026 LONG RANGE PLAN
- SALEM-PLAISTOW-WINDHAM MPO 2007-2010 TRANSPORTATION IMPROVEMENT PROGRAM
- SALEM-PLAISTOW-WINDHAM MPO 2007-2026 LONG RANGE TRANSPORTATION PLAN

Adopted 10/26/2006 by the Seacoast MPO
Adopted 10/27/2006 by the SPW
Edited 1/2/07

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I. Introduction

This document has been prepared for the purpose of making a conformity determination on the amended 2005-2007 State Transportation Improvement Program (STIP), and to demonstrate that the emissions requirements for the Seacoast and Rockingham Planning Commission portion of the Southern NH non-attainment areas meet the new Environmental Protection Agency (EPA) 8-hour ozone non-attainment standards.

EPA issued the 8-hour ozone standard in July 1997, based on information demonstrating that the 1-hour standard was inadequate for protecting public health. Scientific information shows that ozone can affect human health at lower levels, and over longer exposure times than one hour.

On April 15, 2004 the EPA announced the 8-hour ozone designations, which had an effective date of June 15, 2004. Under the Clean Air Act, conformity determinations for metropolitan area transportation plans and TIPs must be made by June 15, 2005.

The 1990 Clean Air Act Amendments (CAAA) requires conformity determinations of Long Range Transportation Plans and Transportation Implementation Plans adopted by MPOs in areas that are in non-attainment for particular pollutants. Conformity determinations are also required in non-attainment areas for all transportation projects funded or approved under Title 23 of the Federal Transit Act. Conformity determinations are necessary to ensure that the transportation system we are planning for, as expressed in the TIP and PLAN, will not result in the worsening of air quality conditions, and in fact will contribute to reaching attainment in accordance with the State Implementation Plan (SIP).

The purpose of the air quality conformity analysis is to project future transportation trends and the resulting emissions. The primary tool for the analysis is the transportation model. The model forecasts emissions changes over time by incorporating transportation projects, such as building additional lanes on roads, signalizing intersections, or adding transit service, as well as projected population growth. Then information is coded into the model and a model run is done for specific analysis years. The results are then compared to the SIP emissions budget.

Under the final regulations of the 1990 CAAA of 1990, a regional transportation plan and the Transportation Improvement Program (TIP) are determined to be in conformity with the Clean Air Act if they meet the following requirements:

1. All the emissions in the future analysis years must be less than the budget for emissions established in the SIP. [Seacoast and Southern NH Serious Non-Attainment Areas]
2. For the marginal non-attainment area, the action scenario ("build") must generate lesser emissions than the base year, 2002 in this case. [Manchester Marginal Non-Attainment Area].

II. Purpose and Scope

Under the new 8-hour ozone non-attainment standards, four counties are wholly or partially included in the non-attainment area. The new 8-hour non-attainment area is smaller and contained within the previous 1-hour non-attainment area (shown in **Figure 1**). **Figure 3** shows the 8-hour non-attainment area (in hatch marks) overlaid on the 1-hour non-attainment The new 8-hour non-attainment area is classified as a moderate and in the area, conformity must be demonstrated for volatile organic compounds (VOCs) and for nitrogen oxides (NOx). The most significant change for New Hampshire is the new 8-hour ozone designation created one non-attainment area for that state that includes 4 MPO areas making coordination and cooperation a must.

Currently the EPA and NHDES have not established an 8-hour emission budget for the new 8-hour non-attainment area. Therefore, as described in 40 CFR 93.109(e)(2)(ii) ***the region must calculate regional emissions and use budgets from the 1-hour SIP for the entire 1-hour area***. If additional reductions, beyond those strategies in the SIP, are necessary to meet the emissions budget those reductions must come from within the 8-hour area. Therefore, the analysis for this conformity determination will follow the same methodology used to demonstrate conformity to the one-hour standard.

The Seacoast MPO includes communities in the Strafford Regional Planning Commission (SRPC) and a portion of the Rockingham Planning Commission (RPC) planning areas. Under the one-hour ozone standard the Seacoast MPO is part of two ozone non-attainment areas, The Seacoast and Southern NH Serious Non-Attainment Areas, and two communities in attainment as of July 1998. **Figure 2** shows how the communities of the Seacoast MPO are categorized in terms of Ozone Non-Attainment Area**.**

The Salem-Plaistow-Windham MPO includes the remaining communities of the Rockingham Planning Commission. The Salem-Plaistow-Windham MPO entirely contained within the Southern New Hampshire Serious Non-Attainment Area. **Figure 2** shows how the communities of the Salem-Plaistow-Windham MPO are categorized in terms of Ozone Non-Attainment Area**.**

This air quality analysis was compiled from information in the Seacoast and Salem-Plaistow-Windham traffic model that was last revised in November 2004. The entire area covered in this report is now a modeled region. In order to compensate for traveled roadways not represented in the modeled network, correction factors have been derived by NHDOT. These factors are based upon the variation between model output and HPMS data for the area.[1]

Projects included in the Plans/TIPs are either classified as "exempt" or "not-exempt". Projects are considered "exempt" if they fall under one or more of the defined exempt categories listed in **Appendix D-1** and are considered to have no impact on air emissions. **Appendix D-2** is a listing of "exempt" projects in the Seacoast and Southern NH (RPC Portion) MPO region.

Projects are considered "not-exempt" if they will have an impact on air quality (positive or negative). **Appendix D-3** lists all the Seacoast and Southern NH (RPC Portion) MPO region projects that are considered to be "not-exempt".

1 This is calculated by dividing the 2002 HPMS based emissions by the 2002 modeled emissions results.

Conformity determinations are required for specified analysis years. Projects are either to be included in the transportation model or as an off-model analysis. The analysis year is based on the year in which the project is expected to be open for use. The model and off-model scenario results reflect the change in emissions if expected transportation projects are implemented and are compared to the budget. Analysis years are defined as follows:

2002	**Base Year**
2007	**Analysis Year 1**
2009	**Analysis Year 2**
2017	**Analysis Year 3**
2026	**Analysis Year 4**

Figure 1

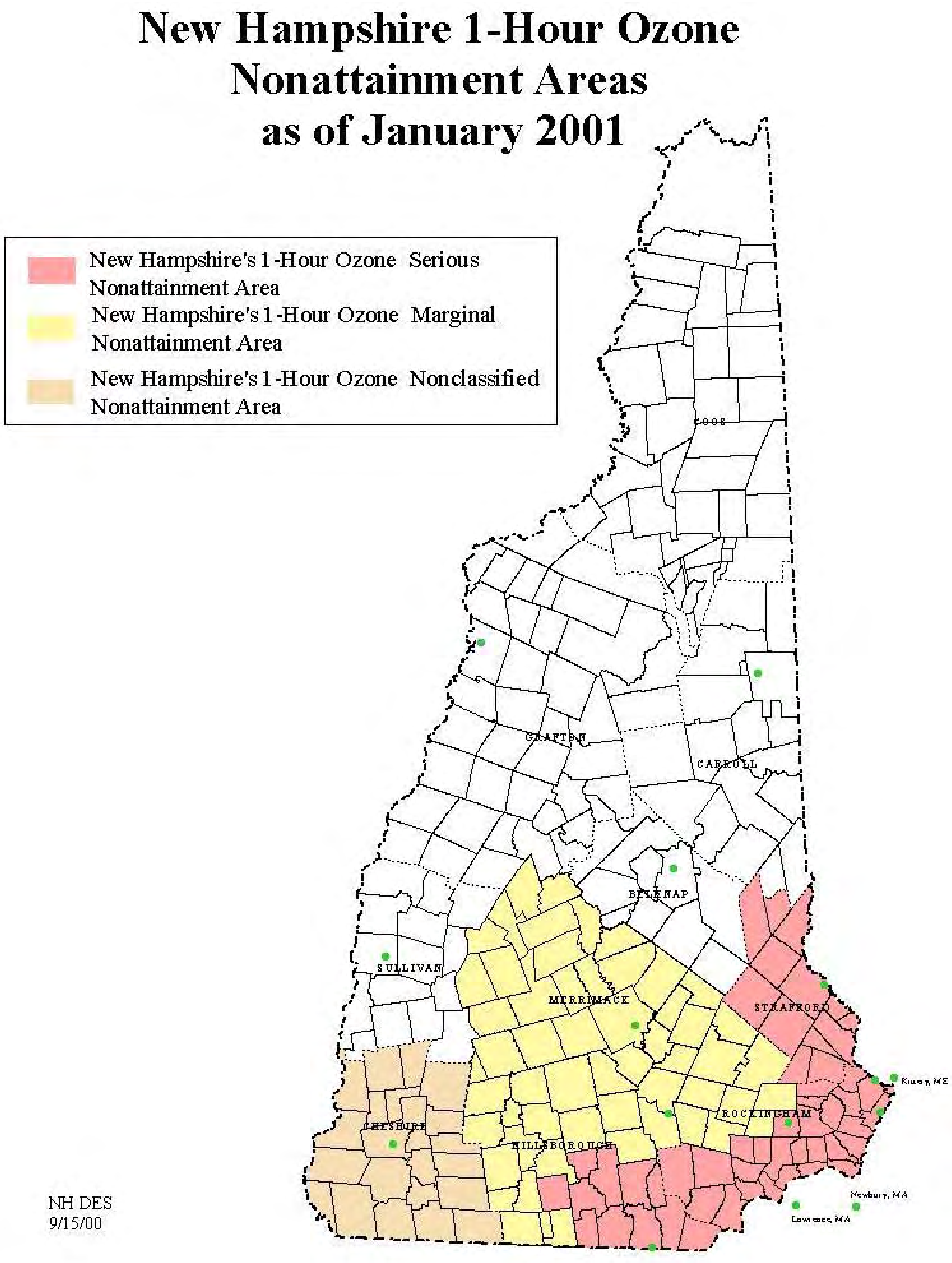

New Hampshire 1-Hour Ozone
Nonattainment Areas
as of January 2001
New Hampshire's 1-Hour Ozone Serious Nonattainment Area
New Hampshire's 1-Hour Ozone Marginal Nonattainment Area
New Hampshire's 1-Hour Ozone Nonclassified Nonattainment Area
COOS
GRAFTON
CARROLL
BELKNAP
SULLIVAN
MERRIMACK
STRAFFORD
ROCKINGHAM
CHESHIRE
HILLSBOROUGH
NH DES
9/15/00

Figure 2
Seacoast and Southern NH (RPC Portion) MPO Communities
Listed According To Ozone Non-Attainment Area

SEACOAST Serious Non-Attainment Area

RPC	SRPC	
Exeter*	Dover*	Milton
Greenland*	Durham*	New Durham
Hampton*	Lee	Strafford
New Castle*	Madbury	
Newfields*	Newmarket*	
North Hampton*	Rochester*	
Newington*	Rollinsford*	
Portsmouth*	Somersworth*	
Rye*	Barrington	
Stratham*	Farmington	
	Middleton	

SOUTHERN NEW HAMPSHIRE (RPC Portion) Serious Non-Attainment Area

Seacoast MPO	Salem-Plaistow-Windham MPO	
Brentwood*	Atkinson*	Plaistow*
East Kingston*	Danville*	Salem*
Hampton Falls*	Hampstead*	Windham*
Kensington*	Kingston*	
Seabrook*	Newton*	
South Hampton*		

MANCHESTER Marginal Non-Attainment Area

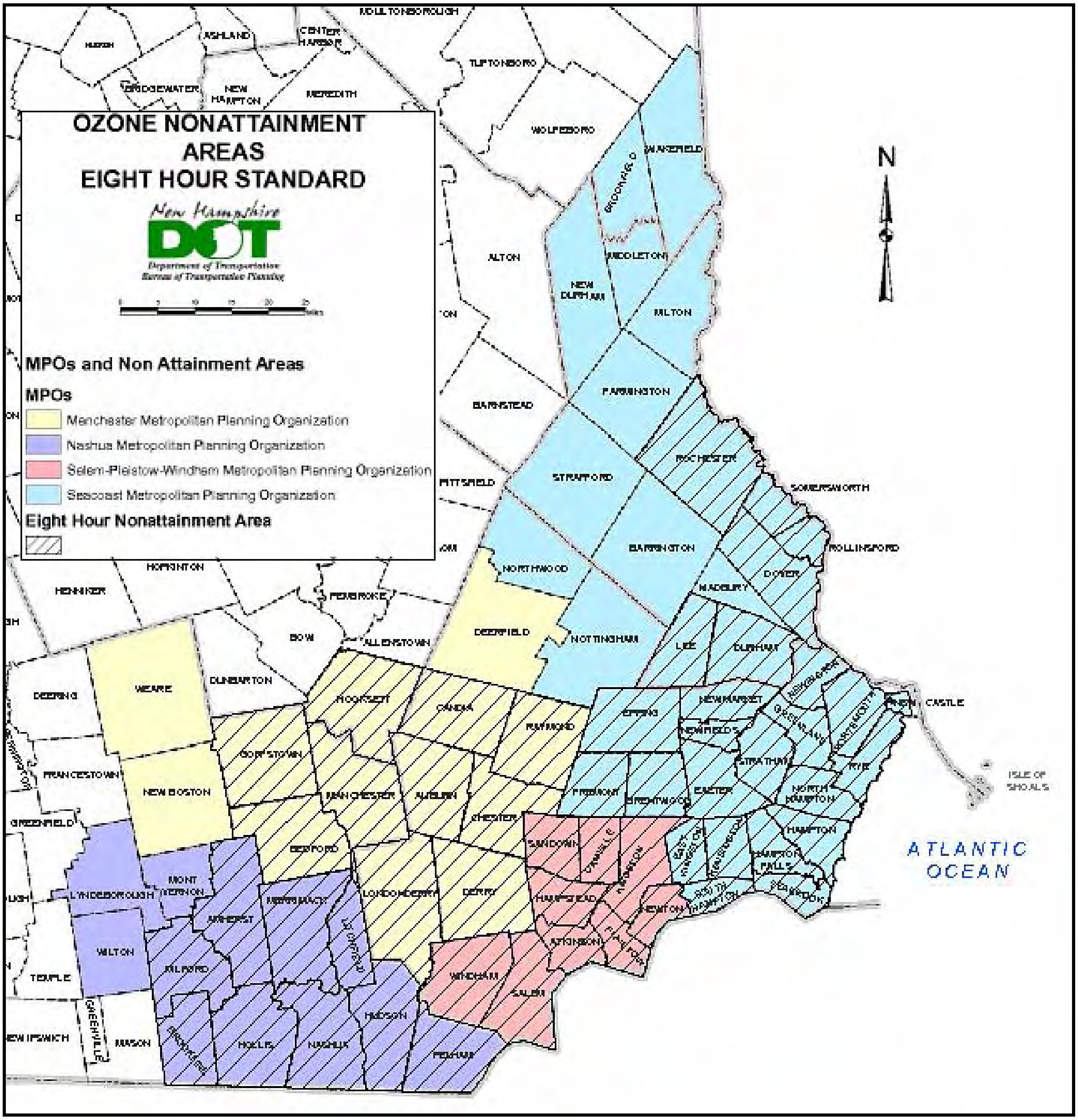
<u>RPC:</u>	<u>SRPC:</u>
Epping*	Northwood
Fremont*	Nottingham

CARROLL County Attainment Area - not included in Analysis

<u>SRPC:</u> Brookfield
Wakefield

* Designates community ***<u>within the new 8-hour non-attainment</u>*** area boundary. The 8 hour non-attainment area boundary is shown in Figure 3.

Figure 3


OZONE NONATTAINMENT AREAS EIGHT HOUR STANDARD
New Hampshire DOT
MPOs and Non Attainment Areas
MPOs
Manchester Metropolitan Planning Organization
Nashua Metropolitan Planning Organization
Salem-Plaistow-Windham Metropolitan Planning Organization
Seacoast Metropolitan Planning Organization
Eight Hour Nonattainment Area
N
ATLANTIC OCEAN
ISLE OF SHOALS
WOLFEBORO
ALTON
MILTON
FARMINGTON
BARNSTEAD
ROCHESTER
STRAFFORD
SOMERSWORTH
BARRINGTON
ROLLINSFORD
DOVER
NORTHWOOD
MADBURY
DEERFIELD
NOTTINGHAM
LEE
DURHAM
HOPKINTON
HENNIKER
BOW
ALLENSTOWN
WEARE
DUNBARTON
DEERING
HOOKSETT
CANDIA
RAYMOND
EPPING
NEWMARKET
NEW CASTLE
FRANCESTOWN
NEW BOSTON
GOFFSTOWN
STRATHAM
RYE
MANCHESTER
AUBURN
FREMONT
BRENTWOOD
EXETER
NORTH HAMPTON
CHESTER
GREENFIELD
SANDOWN
HAMPTON
BEDFORD
LONDONDERRY
DERRY
HAMPSTEAD
NEWTON
MERRIMACK
AMHERST
WILTON
MILFORD
ATKINSON
WINDHAM
SALEM
TEMPLE
HUDSON
MASON
HOLLIS
NASHUA
PELHAM

III. NHDOT Conformity Analysis Procedures

The conformity tests required in the Federal rule must be demonstrated for the respective pollutants in each non-attainment area in its entirety. As shown on **Figure 3**, the boundaries of the MPO areas and the one-hour non-attainment areas do not match. Portions of some MPOs can be found in several non-attainment areas and vice versa. In addition, the 8-hour non-attainment area is wholly contained within the one-hour boundary but also overlaps four MPO areas.

For these reasons, NHDOT has prepared a document entitled "Conformity Determinations for Transportation Improvement Programs, Transportation Plans, and regional emissions analysis of transportation projects in New Hampshire's Non-attainment Areas", which combines analyses for the entire non-attainment area. NHDOT performed the regional emissions analysis for Non-Attainment Areas outside of MPO boundaries to demonstrate that proposed projects in the 2005-2007 State Transportation Improvement Program (STIP) are in conformity with the SIP.

In the absence of an 8-hour emission budget for the new 8-hour non-attainment area the region must calculate regional emissions and use budgets from the 1-hour SIP for the entire 1-hour area. If additional emission reductions, beyond those strategies in the SIP, are necessary to meet the budget, those reductions must come from within the 8-hour area.

Under DES Administrative Rule Env-A 1500 regarding transportation conformity, NHDOT must schedule and convene regular consultation meetings related to the transportation conformity. The MPOs or NH Department of Environmental Services (NHDES) may request that NHDOT schedule a meeting at any time. Regular consultation meetings shall include discussion of activities including, but not limited to:

1) Development of a transportation plan or TIP and any determination of conformity on transportation plans and TIPs, and
2) Emissions analysis for transportation activities, which cross the borders of MPOs or non-attainment areas.

When preliminary conformity findings become available, NHDOT or the MPOs shall provide them to NHDES. The MPOs shall send copies of transportation plans and TIPs that have received a final conformity determination by the MPO to NHDOT and NHDES. NHDOT shall provide copies of these documents to FHWA and FTA for conformity findings. Any final regional emissions analysis for projects outside MPO areas shall be provided to the MPOs and the division by NHDOT. Copies of final conformity determinations for each individual project subject to conformity shall be maintained in NHDOT offices and made available for public inspection.

Projects that are considered regionally significant for purposes of regional emissions analysis shall include any transportation project that is not required to be included in the MPO transportation plan, TIP or STIP, that is not considered exempt according to the federal transportation conformity rule, and which is expected to have a regionally significant impact on travel patterns.

This Submission includes only action runs for 2007, 2009, 2017 and 2025.

IV. Methodology For Seacoast And Southern NH (RPC Portion) MPO Air Quality Conformity Analysis

1. Compile the list of projects and classify each as either "exempt" or "not-exempt" from the following sources:
    a. MPO Plans and TIP and State of New Hampshire Ten Year Program
    b. Regionally significant projects
    c. NHDOT list of regionally significant projects
    d. Other necessary transportation projects

2. Determine the year of implementation for each project.

3. Determine whether or not individual projects can be modeled.

4. Code changes into the model network for each ‘model run’ year.

5. Run the model for the necessary years, including the base year and the analysis years.

6. Isolate road segments by non-attainment area.

7. Calculate total emissions using road segment characteristics (speed, length) and emission factors as provided by NHDES based on EPA’s Mobile 6.2 model.

8. Analyze individual off-model projects to calculate emissions changes.

9. Analyze statewide off-model projects and calculate emissions changes.

10. Compile results of modeled, off-model and statewide projects into standardized tables of emissions. Show results by analysis year and non-attainment area.

V. Air Quality Conformity Analysis Results

Tables 1-3 present the summary of emissions by analysis year for the modeled portion of Seacoast and Southern NH non-attainment area as well as the Manchester Marginal Non-Attainment area within the Seacoast MPO. These tables show the modeling results, off-model adjustments to those results, as well as any adjustments made to the emissions output or budget. **Tables 2 & 3** detail the off model results by project and analysis years. **Appendix D-4** goes into further detail and contains individual analysis sheets (with analysis year results) for all projects in Tables 2 & 3.

Manchester Marginal Non-Attainment Area (Seacoast MPO Portion)
This Non-Attainment area is comprised of three different MPO's, and a portion of the area is not modeled and is outside of MPO boundaries. As a designated "Marginal" area, the Manchester Non-Attainment Area must meet a slightly different emissions test than the Serious Non-Attainment areas of the Seacoast and Southern New Hampshire. This emissions test states that the emissions in a given analysis year must be less than Base Year levels. In addition, because a budget has not been set for the 8 Hour Ozone Standard, this region must meet a "Build vs. No-Build" test where emissions in the build condition must be lower than in the no-build. Given that the Non-Attainment area crosses multiple MPO boundaries, it is the responsibility of the State of New Hampshire Department of Transportation to make the determination of conformity for the Manchester Marginal Non-Attainment area as a whole. It is the responsibility of each MPO to determine the modeled results for its portion of the non-attainment area and check their validity. The Base Year emissions and estimated emissions for the Manchester Marginal Non-Attainment Area (Seacoast MPO Portion) are shown in **Table 1** below.

Table 1: Seacoast MPO Portion of Manchester Marginal Non-Attainment Area

Analysis Year	VMT (mi/day)	NOx (kg/day)	VOC (kg/day)
2002 Emissions – Total Area			
2002 Emissions – Seacoast MPO Portion	**830,845**	**1,701**	**899**
2007	884,444	1,087	573
2009	910,393	898	483
2017	990,321	372	270
2026	1,090,692	210	215

Area with No Build Condition for Epping and Fremont

2007	883,884	1,087	573
2009	910,013	898	488
2017	991,032	372	271
2026	1,004,370	211	215

*Given the information shown in **Table 1** above and preliminary analysis provided by NHDOT, the Transportation Conformity requirements for the Manchester Marginal Non-Attainment area have been met, as the emissions for each analysis year tested are less than those of 2002 and the emissions under the "build" condition for Epping and Freemont are not greater than under the "no build" condition.*

Seacoast Serious Non-Attainment Area
***Table 2** shows that the emissions budgets have been met for the Seacoast Non-Attainment area in analysis years 2007, 2009, 2017, and 2026, meaning that the MPO is in conformity with the SIP for those years.*

Southern NH Serious Non-Attainment Area

As the emissions budget for the Southern New Hampshire Serious Non-Attainment Area is not sub-allocated to the various entities (MPOs and Planning Commissions) within it, the Rockingham Planning Commission portion of the emissions budget is unknown. Given that the Non-Attainment area crosses multiple MPO boundaries, it is the responsibility of the State of New Hampshire Department of Transportation to make the determination of conformity for the Southern New Hampshire Non-Attainment area as a whole. It is the responsibility of each MPO to determine the modeled results for its portion of the non-attainment area and check their validity. The budget for the Southern NH Non-Attainment Area is shown in **Table 3** as well as the estimated emissions for the Rockingham Planning Commission portion of that non-attainment area. The Rockingham Planning Commission portion includes all of the communities of the Salem-Plaistow-Windham MPO as well as a number of the southern communities of the Seacoast MPO.

The modeled emissions estimates listed include off-model emissions adjustments, but do not include adjustments to rectify model outputs with HPMS emissions inventory figures. The HPMS adjustments to the emissions total will occur at the overall Non-Attainment area level [adjustments completed by NHDOT]. *Given the information available, the Transportation Conformity requirements for the Southern NH Non-Attainment area have been met, and the emissions are in conformity with the budgets established in the State Implementation Plan (SIP).*

TABLE 2: SEACOAST NON-ATTAINMENT AREA AQ SUMMARY

			2007			2009			2017			2026		
PROJ NUMBER	**PROJECT**	**Year Progrmd**	**VMT**	**VOC**	**NOx**	**VMT**	**VOC**	**NOx**	**VMT**	**VOC**	**NOx**	**VMT**	**VOC**	**NOx**
02-13CM (13871) & 02-08CM(13868)	Supplemental Parking at Exeter & Durham Train Stations, and Durham/UNH Rail Platform Expansion	2007	3,279	1.630	1.680	3,279	1.660	1.780	3,279	0.790	0.710	3,279	0.550	0.440
94-12TE, 10025A (EXETER), 10023D(DOVER)*	Portland to Boston Passenger Rail Service (Regionally Significant Project)	2002	15,806	8.450	-9.410	16,355	7.060	-10.250	18,931	3.940	-7.610	18,371	2.580	-6.940
02-29CM(13880)	COAST Spaulding Turnpike Express Service	2006	5,534	4.092	-2.390	6,391	3.822	-1.830	9,970	2.757	0.044	13,396	2.630	1.080
98-10CM (13122)	ETC IMPLEMENTATION	2004/05	NOW INCLUDED IN MODEL			NOW INCLUDED IN MODEL			NOW INCLUDED IN MODEL			NOW INCLUDED IN MODEL		
11151E, 11151F & 1463	I-95 & Spaulding Tpk Incident Management System (Part of Statewide RATIS/ITS project)	2004/05	0	12.160	27.090	0	10.260	21.980	0	5.950	9.270	0	4.350	4.770
14287 (04-32CM)	Dover Park & Ride @ Exit 9	2006	Included in COAST Express Analysis above											
06--08CM	Truck Stop Electrification Project in Greenland	2010	NO CREDIT TAKEN			NO CREDIT TAKEN			0.00	1.10	64.80	0.00	0.99	64.80
	TOTAL OFF-MODEL SAVINGS		24,619	26.332	16.970	26,025	22.802	11.680	32,180	14.535	67.214	35,046	11.101	64.150

SEACOAST SERIOUS NON-ATTAINMENT AREA EMISSIONS SUMMARY

	2007			2009			2017			2026		
	VMT	**VOC**	**NOx**	**VMT**	**VOC**	**NOx**	**VMT**	**VOC**	**NOx**	**VMT**	**VOC**	**NOx**
BUDGET		**6323**	**12410**		**6323**	**12410**		**6323**	**12410**		**6323**	**12410**
MODEL OUTPUT (MOBILE 6.2-NHDOT Vehicle & Fleet Age mix)	8,886,791	5851.0	10996.0	9,062,629	4926.0	8973.0	9,805,124	2701.0	3698.0	10,507,358	2068.0	2015.0
SUBTRACT OFF-MODEL ADJUSTMENTS	24,619	26.332	16.970	26,025	22.802	11.680	32,180	14.535	67.214	35046	11.101	64.150
TOTAL EMISSIONS OUTPUT	8,862,172	5824.7	10979.0	9,036,604	4903.2	8961.3	9,772,944	2686.5	3630.8	10,472,312	2056.9	1950.9
HPMS ADJUSTMENT FACTOR	0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SUBTRACT HPMS ADJUSTMENT	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
ADJUSTED OUTPUT	8,862,172	5824.7	10979.0	9,036,604	4903.2	8961.3	9,772,944	2686.5	3630.8	10,472,312	2056.9	1950.9
AMOUNT (OVER) UNDER BUDGET IN KG		**498.3**	**1431.0**		**1419.8**	**3448.7**		**3636.5**	**8779.2**		**4266.1**	**10459.2**
% (OVER) UNDER BUDGET		7.88%	11.53%					57.51%	70.74%		67.47%	84.28%

	VMT	VOC	NOx
2002 EMISSIONS (BASELINE)	7,701,662	8,551	16,163

* Downeaster Project analysis includes benefits of proposed CMAQ project to add sidings to facilitate a 5th train per day during commute hours.

VMT = Vehicle Miles of Travel/ Day
VOC = Volatile Organic Compounds (kg/day)
NOx = Nitrogen Oxides (kg/day)

TABLE 3: AQ SUMMARY FOR SEA AND SPW MPO PORTION OF SOUTHERN NH NON-ATTAINMENT AREA

PROJ NUMBER	PROJECT	Year Programmed	2007 VMT	2007 VOC	2007 NOx	2009 VMT	2009 VOC	2009 NOx	2017 VMT	2017 VOC	2017 NOx	2026 VMT	2026 VOC	2026 NOx
	Salem, Windham, Londonderry Park & Rides & bus service		INCLUDED IN 10418L, 04-33CM			INCLUDED IN 10418L, 04-33CM			INCLUDED IN 10418L, 04-33CM			INCLUDED IN 10418L, 04-33CM		
10418R	Salem Adaptive Signal Controls - Integrated with I-93 ITS and will include Pelham Rd. and NH 28 Signal Coordination benefits		NO CREDIT TAKEN			0.00	10.54	4.41	0.00	6.24	2.13	0.00	3.34	0.77
04-20CM	SE-TRIP - TMA, Derry-Salem Bus Service, Pedestrian Improvements	2006	4,041	1.930	-0.130	4,995	1.970	0.016	5,158	0.9300	-1.0200	5,586	0.660	0.260
10418L, 04-33CM	I-93 Expanded Bus Service + P&R Construction at Exits 2, 4, 5	2006	19,748	13.590	3.140	19,865	1.990	2.000	20,041	5.2500	0.8700	20,041	3.680	1.520
10418Z	I-93 Incident Management System (10418Z)	2006	0	33.300	59.060	0	26.350	47.490	0	14.3700	19.7100	0	10.930	10.390
11151E, 11151F & 14631	I-95 Incident Management System (Southern NH Portion)	2005	0	3.270	7.280	0	2.760	5.910	0	1.6000	2.4900	0	1.170	1.280
	TOTAL SAVINGS		23,789	52.090	69.350	24,860	43.610	59.826	25,199	28.390	24.180	25,627	19.780	14.220

SOUTHERN NH SERIOUS NON-ATTAINMENT AREA (ROCKINGHAM PLANNING COMMISSION PORTION) EMISSIONS SUMMARY

	2007 VMT	2007 VOC	2007 NOx	2009 VMT	2009 VOC	2009 NOx	2017 VMT	2017 VOC	2017 NOx	2026 VMT	2026 VOC	2026 NOx
MODEL OUTPUT (MOBILE 6.2-NH Vehicle and Fleet Age mix)	4,497,998	3100.0	5475.0	4,591,963	2,591.0	4,553.0	4,876,692	1399.0	1859.0	5,211,720	1084.0	1015.0
SUBTRACT OFF-MODEL ADJUSTMENTS	23,789	52.090	69.350	24,860	43.610	59.826	25,199	28.390	24.180	25,627	19.780	14.220
TOTAL EMISSIONS OUTPUT	**4,474,209**	**3047.9**	**5405.7**	**4,567,103**	**2547.4**	**4493.2**	**4,851,493**	**1370.6**	**1834.8**	**5,186,093**	**1064.2**	**1000.8**

	VMT	VOC	NOx
2002 EMISSIONS (BASELINE)	3,866,277	4,361	8,118

VMT = Vehicle Miles of Travel/ day
VOC = Volatile Organic Compounds (kg/day)
NOx = Nitrogen Oxides (kg/day)

APPENDIX D-1: EXEMPT CODE LIST

PROJECTS EXEMPT FROM CONFORMITY

SAFETY
E-1 Railroad/highway crossing.
E-2 Hazard elimination program.
E-3 Safer non-Federal Aid system roads.
E-4 Shoulder improvements.
E-5 Increasing sight distance.
E-6 Safety improvement program.
E-7 Traffic control devices and operating assistance other than signalization projects.
E-8 Railroad/highway crossing warning devices.
E-9 Guardrails, median barriers, crash cushions.
E-10 Pavement resurfacing and/or rehabilitation.
E-11 Pavement marking demonstration.
E-12 Emergency relief (23 U.S.C. 125).
E-13 Fencing.
E-14 Skid treatments.
E-15 Safety roadside rest areas.
E-16 Adding medians.
E-17 Truck climbing lanes outside the urbanized area.
E-18 Lighting improvements.
E-19 Widening narrow pavements or reconstructing bridges (no additional travel lanes).
E-20 Emergency truck pullovers.

MASS TRANSIT
E-21 Operating assistance to transit agencies.
E-22 Purchase of support vehicles.
E-23 Rehabilitation of transit vehicles.{1}
E-24 Purchase of office, shop, and operating equipment for existing facilities.
E-25 Purchase of operating equipment for vehicles (e.g., radios, fareboxes, lifts, etc.)
E-26 Construction or renovation of power, signal, communications systems.
E-27 Construction of small passenger shelters and information kiosks.
E-28 Construction or renovation of transit buildings and structures (e.g., rail or bus buildings, storage and maintenance facilities, stations, terminals, and ancillary structures).
E-29 Rehabilitation or reconstruction of track structures, track, and track bed in existing rights-of-way.
E-30 Purchase of new buses and rail cars to replace existing vehicles or for minor expansions of the fleet.{1}
E-31 Construction of new bus or rail storage/maintenance facilities categorically excluded in 23 CFR part 771.

AIR QUALITY
E-32 Continuation of ride-sharing and van-pooling promotion activities at current levels.
E-33 Bicycle and pedestrian facilities.

OTHER
Specific activities which do not involve or lead directly to construction, such as:
E-34 Planning and technical studies.
E-35 Grants for training and research programs.
E-36 Planning activities conducted pursuant to titles 23 and 49 U.S.C.
E-37 Federal-aid systems revisions.
E-38 Engineering to assess social, economic, and environmental effects of the proposed action to alternatives to that action.
E-39 Noise attenuation.

E-40 Advance land acquisitions (23 CFR part 712 or 23 CFR part 771).
E-41 Acquisition of scenic easements.
E-42 Plantings, landscaping, etc.
E-43 Sign removal.
E-44 Directional and informational signs.
E-45 Transportation enhancement activities (except rehabilitation and operation of historic transportation buildings, structures or facilities).
E-46 Repair of damage caused by natural disasters, civil unrest, or terrorist acts, exempt projects involving substantial functional, locational or capacity changes.
ATT. Project is located in attainment area and, therefore, not subject to conformity.

PROJECTS EXEMPT FROM REGIONAL EMISSIONS ANALYSES
E-51 Intersection channelization projects.
E-52 Intersection signalization projects at individual intersections.
E-53 Interchange reconfiguration projects.
E-54 Changes in vertical and horizontal alignment.
E-55 Truck size and weight inspection stations.
E-56 Bus terminals and transfer points.

OTHER EXEMPT CODES
N/E Project is not exempt
{1} PM10 nonattainment or maintenance areas, such projects are exempt only if they are in compliance with control measures in the applicable implementation plan.

APPENDIX D-2: EXEMPT PROJECTS LIST

Town	Project #	Scope of Work	CAACode
Atkinson - Hampstead		Reconstruct From Central Street In Hampstead To The Southern Most Atkinson / Hampstead Town Line (3.2 Miles)	E-10
Coast		General & Comprehensive Planning	E-36
		Misc. Bus Station Equipment	E-28
		Misc. Support Equipment	E-24
Danville	13535	Replace Bridge Over Exeter River - 047/126	E-19
Dover	12644	Construct 3500' Sidewalk From Weeks Crossing To Long Hill Road [96-28TE]	E-33
	13042	Replace Bridge Over B&M Railroad - 109/106	E-19
	13089	Construct New Sidewalk (2000') In High Density Residential / Employment Center Area To Complete Previously Approved Project [98-14TE]	E-33
	13482	Construct Bike Path Along Rail Line From Rail Station To NH 108 / Bellamy Park [00-20TE]	E-33
	13796	Bridge Rehabilitation Over B&M Railroad - 120/118	E-19
	13945	Bridge Replacement Over Cocheco River - 136/123 (future)	E-19
	14321	Install Street Lighting At Exit 7 Interchange; Force Account With Public Service Co Of NH	E-18
	14344	Repair 50 Pole Lights On Bridge Over Bellamy River - 174/034, Applying Locktite And Locking Washers To The Ballasts And Sockets	E-18
Dover - Somersworth	12608	Add Left Turn Lane At Long Hill Road	E-51
Durham		Interchange Improvements And Reconfiguration Including The Installation Of Traffic Signals, Dedicated Turning Lanes, Signage, Etc. - Phase 2	E-53
	04-13TE	NH 155a Main Street Improvements - Construct Sidewalks, Multi-use Paths & Bicycle Shoulders Along NH 155a For Approximately 1.1 Miles Approaching The Unh Campus And Downtown Durham [04-13TE]	E-33
	04-15TE	UNH Rail Station renovation - renovate thehistoric elements of the Durham rail station and related elements. Restore the signal semaphore located atop the station. Limited restoration of slate roof finials and support structure. Rebuild 2 existing wood wheeled luggage carts. Develop and install exterior information displays regarding the history of rail service to Durham [04-15TE]	E-28
Durham - Newmarket	13080	Construct 4' Bike Shoulders From Oyster River Bridge To Dame Road And Sanborn Ave In Newmarket (3.4mi) [98-17TE]	E-33
Epping	13712	Reconstruction From Brentwood T/L North To NH 87	E-6
Epsom - Northwood	13336	Rehabilitation & Safety Work, Beginning At NH 107, Proceeding East Approximately 7.5 Miles To Ridge Road - [federal Resurfacing / Crackseal Program]	E-10
Exeter	13092	Construct Bike Shoulders [98-02TE]	E-33
		Implementation Of Access Management Plan Developed By Exeter To Likely Include Row Acquisitions And Driveway Consolidation	E-6
	14090A	Bridge Replacement Over B&M Railroad - 088/076	E-19
Farmington	14129	Bridge Rehabilitation Over Cocheco River - 121/141 [emergency Repair]	E-19
Greenland		Intersection Improvements @ Ocean Road, Adding Additional Turning And Through Lanes	E-51

Town	Project #	Scope of Work	CAACode
Hampton	13891	Phase 3 Of North Hampton, Hampton And Exeter Regional Bike Loop: Construct 4' Shoulders And Pavement Markings From Us 1 Along High Street, Towle Avenue, And Winnacunnet Road To NH 1a [02-23TE]	E-33
	14188	Bridge Rehabilitation Replacing Deck And Fender System Over Hampton River - 235/025	E-19
	14281	Hampton Toll Plaza, 2004 Second Year One-way Toll Test, Southbound Toll Test	E-34
	13676B	Removal Of Lead Paint & Complete Repainting Of Bascule Span Of Hampton River Bridge - 235/025	E-19
	13930A	Bridge Rehabilitation Over B&M RR - 162/142	E-19
Hampton - Portsmouth - Dover - Rochester	14147	Resurfacing For Sfy 2005 And Overhead Sign Structure Replacement	E-10
Kensington	13908	Kensington Town Center Enhancements: Landscaping, Stone Wall, And Bike/pedestrian Improvements To Parking Lot In Town Center [02-30TE]	E-45
Kingston	14046	Traffic Signal Upgrades & Minor Reconstruction @ Intersection With NH 111 / Main Street And The Intersection With NH 107 / Scotland Road	E-52
Lee	14063	Construct Left Turn Lane To Complete Safety Improvement Intersection @ NH 155a - Phase 2	E-6
		Relocation & Signalization @ High Street	ATT
Madbury	12922	Replace Bridge Over B & M Railroad - 114/084	E-19
	04-31TE	Center/civic District Multi-use Paths - Construct Bike/ped Paths. Paths In Approximately 1/2 Mile Town Square, Town Center/civic District Bounded On The South By NH155 And On The North By Town Hall Road. Approx. 3/4 Of A Mile Of Asphalt Or Other Natural	E-33
Metro Planning	5303-MP-3	Salem - Plaistow - Windham Metropolitan Planning Organization Transit Planning	E-36
	5303-MP-4	Seacoast Metropolitan Planning Organization Transit Planning	E-36
Milton	14077	Reconstruct Crossing, Roadway & Upgrade Signals @ NH Northcoast, USDOT-AAR #054-232P	E-1
Milton, Nh - Lebanon, Me	13748	Bridge Replacement Over Salmon Falls River - 198/131	E-19
New Castle - Portsmouth		Bridge Painting Over Piscataqua Estuary - 031/142 & 241/053	E-19
New Castle - Rye		Rehabilitate Single Leaf Bascule Moveable Bridge Over Little Harbor - 066/071	E-19
Newington	14064	Reconstruct & Improve Nimble Hill Road	E-10
Newmarket	13499	Reconstruct Main Street To Improve Pedestrian Facilities [00-73TE]	E-33
	14026	Paint Bridge Over Lamprey River - 127/097	E-19
North Hampton	13501	Construct Shoulder From I-95 To Us 1 [00-77TE]	E-33

Town	Project #	Scope of Work	CAACode
Northwood - Nottingham	10429E	Intersection Safety Improvement @ NH 152	E-51
Nottingham	11140	Safety Improvements Including The Construction Of Eastbound Passing Lane	E-6
	13795	Bridge Replacement Over Little River - 204/082	E-19
	14240	Bridge Replacement Over North River - 145/145	E-19
Plaistow	13803	Widening For Center Turn Lanes From The Massachusetts S/L To Westville Bridge	E-51
Plaistow - Atkinson	12359	Replace Bridge Over Little River & B&M RR - 105/028	E-19
Portsmouth	10665	Replace Bridge Over B & M RR - 154/101	E-19
	12329	Reconstruct From Middle Street To Pleasant Street [phase I]	E-10
	12575	Reconstruct Crossing & Signals @ B&M RR USDOT-AAR #054-125A	E-8
	12683	Create Safe Bicycle Route From Downtown Portsmouth To Bike / Ped Bridge Into Pease International Tradeport [96-17TE]	E-33
	12900	Reconstruct From Traffic Circle North To Sarah Long Bridge Including Bridges 211/114, 227/112, & 205/116	E-19
	13523	Reconstruction Of New Castle Ave (nh 1b) From Marcy Street To Bridge Over Piscataqua River Inlet	E-10
	13862	Bridge Painting: I-95 SB Over Spaulding Tpk - 198/123; I-95 NB Over Spaulding Tpk - 197/122	E-19
	13863	Bridge Painting: I-95 SB Over I-95 Wb Off-ramp - 184/124; I-95 SB On-ramp Over I-95 NB - 183/121	E-19
	13864	Bridge Painting: Northwood Rd Over I-95 Wb Off-ramp - 191/131; I-95 SB On-ramp Over I-95 Wb Off-ramp - 180/122; Spaulding Tpk Ramp Over I-95 Wb Off-ramp - 199/139	E-19
	13903	Piscataqua Riverwalk: Construct 400 Lf Of Pedestrian Facility And Pier Along The Piscataqua River Paralleling Bow Street [02-53TE]	E-33
	14193	Reconstruct & Reclassify As A City Street. (sah Funding Capped Per Year; Excess Of Grand Total [$1,200,000] Will Be 50/50 Match)	E-10
		Interchange Improvements @ Market Street	E-53
		Intersection @ Constitution Ave And Roadway Improvements	E-51
		Paint Bridge Approaches To Bridge Over Piscataqua River - 258/128	E-19
		Reconstruct From Wilson Road To Constitution Ave	E-10
	04-54TE	Trade Port Multi-use Path - Construct A Multi Use Path Along Grafton Dr Between NH Avenue And Portsmouth Transportation Center, And Between Pease Golf Course And Airport Rd [04-54TE]	E-33
Portsmouth - Rochester	14232	Installation Of 2 Overhead Signs And Emergency Reference Markers	E-44
Portsmouth, Nh - Kittery, Me	13678	Rehabilitate Bridge Over Piscataqua River - 247/084 (Memorial Bridge) & Replace Scott Avenue Bridge - 246/083	E-19
	13679	Paint Bridge Over Piscataqua River - 247/084	E-19
		Rehabilitate & Paint Bridge Over Piscataqua River - 251/108 (Sarah Mildred Long Bridge)	E-19

Town	Project #	Scope of Work	CAACode
Rochester	11922	Construct Pedestrian Bike Path On Acquired B&M RR Land [93-11TE]	E-33
	13274	Roadway Reconstruction From Whitehall Road To Columbus Avenue	E-10
	13590	Rehab Bridge Over Blackwater Road - 194/149	E-19
	14019	Bridge Rehabilitation Over Cocheco River - 127/106	E-19
	14108	Reconstruct Intersection @ Church Street	E-53
	14216	Rehabilitate Pavement Of Left Turn Lane To Rochester Neck Road	E-10
	14286	Intersection Improvements at NH 11/Little Falls Rd.	E-51
		Intersection Improvements To Improve Safety Through Strafford Square In Vicinity Of North Main & Washington Streets	E-51
Rochester - Portsmouth - Seabrook		Resurfacing For Sfy 2007	E-10
Rollinsford	14241	Pavement Rehabilitation And Safety Work Beginning At Dover T/L, Proceeding East Aprox 2.9 Miles To Maine S/L - [Federal Resurfacing Program]	E-10
Rye	12595	Reconstruct Foyes Corner	E-53
	13269	Replace Wooden Bridge Over Seavey's Creek - 252/156	E-19
	12595A	Demolish One Building In The Southwest Corner Of The New Intersection Of Sagamore / Elwyn / Pioneer Road	E-53
Salem - Atkinson	13428	Guardrail Upgrade And Other Related Work From Windham T/L To Hampstead T/L (betterment Guardrail Improvement Program)	E-6
Salem To Northfield	14313	Widen Shoulders At Median Cross-overs At Various Locations	E-4
Sandown	14260	Bridge Replacement Over Exeter River - 098/117	ATT
	04-56TE	Town Center Sidewalk Improvement Plan - Construct Approximately 2,000' Of Sidewalk Along East Side Extending From Sandown Elementary School To Sandown Depot, Connecting School, Town Library, Town Hall, Depot Museum, Rail Trail, And Adjacent Residential Ar	E-33
Seabrook	13790	Traffic Signal Upgrade @ Hooksett Road	E-52
Seabrook-portsmouth	14298	Resurfacing For Sfy 2006	E-10
Somersworth	04-59TE	Renovate The Historic B&M Railroad Station 319 In Downtown Somersworth Creating A Publicly Accessible Historic Area & Multi-modal Transportation Focal Point In The Downtown [04-59TE]	E-28
Stratham / Epping - Lee / Lee - Durham		1" Overlay: Stratham, NH33 From NH108 East To Voc Tech School (2.0 Miles); Epping-Lee, NH125 From NH87 North To NH 152 (3.08 Miles); Lee-Durham, US4 From Lee Traffic Circle East To Sewage Treatment Plant (6.1 Miles) - [Federal Resurfacing Program]	E-10
Wakefield	14085	Construct 10 Foot Shoulders, 12 Foot SB,NB And Left Turn Lane At The Junction Rte 16 And Gage Hill & Wakefield Roads	ATT
	14087	Extend Shoulder Width 12 Foot For Acceleration & Deceleration Lanes For The NH 16 SB Traffic At The Junction Of Long Ridge Road	ATT
	14088	Extend Shoulder To 12 Foot Acceleration & Deceleration Lanes For The NH 16 SB Traffic At The Junction Of Wilson Road	ATT
Windham	13113	Phase 1 To Construct Shared Roadway Bicycle Lane - 2.1 Miles [98-03TE]	E-33

APPENDIX D-3: NOT-EXEMPT PROJECTS LIST

Town	Project #	Route/road	Scope of Work	Phase	FY	First Analysis Year
Dover	14287	Indian Brook Drive	Construct Park'n' Ride Facility (approximately 280 Space) Including A Terminal Building In The Vicinity Of Exit 9 Of The Spaulding Turnpike [04-32CM]	CON	2007	2007
Dover - Rochester - Somersworth		NH 108	Widening And Reconst. From The Weeks Corner Int. North 4.8 Miles To The NH 108 Int. With Granite Parkway In Rochester And Widening Of Sixth St. Connector Bridge Over The Spaulding Tpk At Exit 9 With NB Off-ramp Reconst.	CON	2014	2017
	11429B	Spaulding Tpk	Construction Of Exit 10 And Easterly Connection - Phase 1	CON	2014	2017
	11429C	Spaulding Tpk	Construction Of Exit 10 And Easterly Connection - Phase 2	CON	2014	2017
	11429D	Spaulding Tpk	Construction Of Exit 10 And Easterly Connection - Phase 3	CON	2014	2017
Durham	13867	Main Street	Reconstruct Main St To Permit Bi-direction Transit Shuttle Service / Project Includes Bike/ped Safety Improvements From Western Edge Of Campus To Downtown @ Pettee Brk Ln: Construct Of Transit Pull-outs, Central Median Creation, Delineation Of Xwalks, Lig	CON	2006	2007
	13868		Development Of Expanded Or Replace Accessible Rail Platform, Station Bldg Ext/int Renovation To Include Dedicated Indoor Traveler Waiting Space And Construct Full Intermodal Bus Access To Platform Area. Improved Ped. Access Around Station And/or Over Tra	CON	2006	2007
	13869		Purchase Three 14 Passenger Transit Vehicle For Expansion Of Unh Wildcat Shuttle System Beyond Core Campus Areas [02-09CM]	CON	2006	2007
Durham & Surrounding Communities	13870		Funding For Non-transit (fleet) Vehicle Infrastructure Share Of Regional Cng Fueling Station And Funding For Marginal Cost Of "cng" Engines On New Fleet Vehicles (police, Service, Etc) [02-10CM]	CON	2005	2007
Epping		NH 125	NH 125 widened to 2 through lanes each direction and center turn lane from NH 101 north through intersection with Main Street. Main St. intersection reconfigured and signalized.	CON	2004	2007
Exeter	13871	Lincoln Street	Expand Existing Passenger Railroad Station Parking Area (project #10025a) From 78 To 140 Parking Spaces [02-13CM]	CON	2007	2007
Greenland		NH 33/Ocean Rd	Intersection Improvements @ Ocean Road, Adding Additional Turning And Through Lanes	CON	2013	2017
		TravelAmerica Center	Truck stop electrification @ TravelAmerica Travelcenter. 50 space implementation of IdleAire Technologies to reduce idling.	CON	2010	2017
Hampton		NH 27	BRIDGE REPLACEMENT OVER B&M RR - 162/142	CON	2006	2007
Hampton - North Hampton	13760	I-95	Widen Hampton Ramp Toll Plaza to 8 collection lanes including roadway approach & departure widening to accommodate increased traffic demands and including bridge work and install emergency reference markers from Mass S/L to Maine S/L	CON	2005	2007
Lee	14063	NH 155	Construct Left Turn Lane To Complete Safety Improvement Intersection @ NH 155A - Phase 2	CON	2005	2007
	14063	NH 125/NH 152	RELOCATION & SIGNALIZATION @ HIGH STREET	CON	2006	2007
Milton	13874	Various	Construction Of Sidewalks To Connect: Elementary School With High School & Library; Learning Center, Church, & Vfw With Major Residential Areas; Remaining Links To Address Commuter Flows From Remick & Steeple Streets [02-19CM]	CON	2006	2007
	14077	NH 125	Reconstruct Crossing, Roadway & Upgrade Signals @ NH Northcoast, USDOT-AARR #054-232p	CON	2007	2007

Town	Project #	Route/road	Scope of Work	Phase	FY	First Analysis Year
Newcastle		NH 1B	Rehabilitate Single Leaf Bascule Moveable Bridge Over Little Harbor - 066/071	CON	2011	2017
Newington		Shattuck Way	Constructed Access Road from Spaulding Turnpike Exit 4 to industrial park with access points to Woodbury Avenue	CON	2002	2007
	14064	Nimble Hill Rd	Reconstruct and Improve	CON	2005	2007
	11238C	NH 16 / Us 4 / Spldg Tpk	Reconfiguration And Relocation Of Ramps And Access	CON	2005	2007
Newington - Dover	11238	NH 16 / Us 4 / Spldg Tpk	Widen Turnpike Including Little Bay Bridges From Gosling Road To Dover Toll	CON	2010	2017
					2011	2017
					2012	2017
Newmarket	13878	NH 108	Construct 4' Bike Shoulders From The Southerly Limit Of Project 13107 In Newmarket To The Northerly Limit Of Project P4386 In Newfields [02-25CM]	CON	2006	2017
Plaistow - Kingston	10044B	NH 125	Reconstruction From East Road In Plaistow Northerly Approx. 6.0 +/- Mile To NH 125	CON	2010	2017
	10044		Widening, reconstruction and singalization at Hunt Road/Newton Jnct. Road	CON	2005	2007
	10044D		Reconstruct Intersection of Old County Road	CON	2007	2009
	10044E		Reconstruct Intersection of Roadstone Dr. & Construct Extension of Kingston Rd.	CON	2008	2009
Plaistow, NH To Haverhill, MA	13515		Construct Rail Platform & Provide Three Years Of Operating Subsidy For Passenger Rail [00-20CM]	CON	2009	2009
Portsmouth	13455	Us 1 Bypass	Reconstruct From Sagamore Creek Project To Traffic Circle, Including Bridges 173/071, 183/087, 189/100, 188/097, 192/106	CON	2012	2017
					2013	2017
	13516	Woodbury Ave / Market Street	Signal Coordination Along Woodbury Ave From I-95 Interchange To Gosling Road [00-21CM]	CON	2007	2009
	04-16CM	Market Street Extension	Bike/ped Path, Between Michael Succi Drive And The NH Port Authority [04-16CM]	CON	2007	2009
Rochester	13517	NH 125	Signal Coordination From Brock Street To Lowell Street [00-23CM	CON	2005	2007
	10620G	Spaulding Tpk	Construction Of Exit 11 & 12 (NH 125) Bridges And 2nd Barrel - Phase 1	CON	2007	2009
	10620H	Spaulding Tpk	Construction Of 2nd Barrel Through Exit 13 - Phase 2	CON	2007	2009
					2008	2009
	10620I	Spaulding Tpk	Construction Of 2nd Barrel Through Exit 14 And Exit 15 - Phase 3	CON	2010	2017
	10620J	Spaulding Tpk	Construction Of 2nd Barrel Through Exit 16 (chestnut Hill Connector) - Phase 4	CON	2012	2017
					2013	2017
	10620K	Spaulding Tpk	Exit 11 & 12 (NH 125) Bridges And 2nd Barrel - Phase 2	CON	2008	2009
					2009	2009
	10620L	Spaulding Tpk	Construction Of 2nd Barrel Through Exit 14 & 15 - Phase 3, Part B	CON	2013	2017
Rochester-somersworth-Dover-newington-Portsmouth	13880	Spaulding Tpk	"Express" Bus Service For General Public Between Rochester & Portsmouth To Have Timely Connections With Inter-city & Local Transportation Services [02-29CM]	CON	2007	2007
Salem	12334	NH 28	Reconstruct Intersection, Main Street @ Depot Street, Including Signals, Left Turn	CON	2009	2009
	13119	I-93 (exit 1)	Construct 500+ Space Park'n'ride With Bus Terminal @ Rockingham Blvd [98-09CM]	CON	2014	2017
	13518	Pelham Road	Signal Coordination From North Policy Road West To Stiles Road [00-24CM]	CON	2005	2007
	10418R	NH 28	Integration of Coordinated Traffic Signal Control, Video Surveillance, emergency and incident response support and communications	CON	2007	2009
	04-20CM	(blank)	Transportation Management Association, Bus Service And Bike/ped Path [04-20CM]	CON	2007	2007

APPENDIX D-3: NOT EXEMPT PROJECTS LIST

Town	Project #	Route/road	Scope of Work	Phase	FY	First Analysis Year
Salem-Derry		Transit	Demand-response transit expansion and coordination for the 10 town Greater-Derry and Salem region	OPERATIONS	2007	2007
Salem To Manchester	10418F	I-93	Construction Of Wetland Mitigation Sites In Anticipation Of Wetland Impacts Associated With Future Improvements To I-93 From Salem To Manchester. Includes: Londonderry L-8, L-8 Extension, L-12 Sites; & Londonderry Advance Mitigation / Wetland Creation [	CON	2013	2017
	10418G	I-93	Park & Ride @ Exit 2 (Salem) [part Of 04-33CM]	CON	2007	2007
	10418H	I-93	Park & Ride @ Exit 3 (Windham) [part Of 04-33CM]	CON	2010	2017
	10418J	I-93	Widening From Mass S/l Northerly To I-293 Including Bridges	CON	2011 2012 2013 2014	2017 2017 2017 2017
	10418L	I-93	Implement Expanded Bus Service & New Commuter Incentive Program. Purchase 14 Commuter Coaches & Provide 3 Years Of Operating Support [04-04CM]	CON	2005 2006	2007 2007
	10418Z	I-93	Implementation Of Incident Management And Its Technologies For Overall Corridor, To Improve Efficiency Before, During & After I-93 Construction	CON	2007	2007
	13933A	I-93	Reconstruct & Widen Mainline From S/l To Exit 1 (Salem)	CON	2009	2017
	13933B	I-93	Replace Cross Street Bridge And Exit 1 Embankment (Salem)	CON	2006	2017
	13933C	I-93	Exit 1: Replace Ramp Bridges & Reconstruct Ramps (Salem)	CON	2006	2017
	13933D	I-93	Reconstruct & Widen Mainline Between Exit 1 & 2 And Replace Bridges Over NH 38 (Salem)	CON	2008	2017
	13933E	I-93	Exit 2, Replace Bridges Over Pelham Road (Salem)	CON	2008	2017
	13933F	I-93	Exit 2 Interchange (Windham)	CON	2009	2017
	13933G	I-93	Median Work & Replace Brookdale Road Bridge (Salem)	CON	2008	2017
	13933H	I-93	Construct Relocated Mainline & New Bridges Over NH 111a From Brookdale Rd (approx) To NH 111a (Salem-Windham)	CON	2007 2008	2017 2017
	13933I	I-93	Exit 3 NH 111 Bridges And NH 111 Relocation (Windham)	CON	2006 2007	2017 2017
	13933J	I-93	Exit 3 Interchange (Windham)	CON	2008	2017
	13933K	I-93	Reconstruct And Widen Mainline North Of Exit 3 Through Weigh Stations (Windham)	CON	2011	2017
	13933L	I-93	Reconstruct & Widen Mainline (projects To Be Broken Out)	CON	2009	2017
Seabrook - Portsmouth	11151E	Blue Star Tpk (i-95)	Its Deployment; Its Initiative Allowing For Deployment Of Changeable Message Boards, Highway Advisory Radio To Improve Motorist Safety And Awareness [04-31CM]	CON	2007	2007
	11151F	Blue Star Tpk (i-95)	Its Deployment; Its Initiative Allowing For Deployment Of Changeable Message Boards, Highway Advisory Radio To Improve Motorist Safety And Awareness	CON	2007	2007
Seacoast	14631	I-95	Congestion Mitigation Project to include the installation of various ITS Devices. Project is Earmarked funding for 11151E and 11151F Seabrook-Portsmouth Incident Management System for I-95	CON	2007	2007
	06-25CM	Multiple	Seacoast Commuter Options - Program expansion/accelerated implementation.	OPERATIONS	2007	2007
Statewide	14354	MISC	Expansion of the Alternative Fuel Vehicle Project (AFVP) to provide incremental costs of AFVS and 80% Infrastructure costs [04-05CM]	CON	2007	2007
	06-27CM	Various	Traffic Signal Optimization - Non-Attainment Towns Only [06-27CM]	CON	2009	2009
		TRAFFIC	Transportation Systems Managament & Operations (ITS, CARS-511)	OPERATIONS	2007-2010	2007
Windham	13884	NH 111	Upgrade Signal Controllers & Computer Equipment To Establish A Coordinated Signal Timing Plan @ Intersections Of Lowell Road, Fellows Avenue / North Lowell Road, & Village Green [02-34CM]	CON	2005	2007
Windham - Salem	10075A	NH 111	Reconstruction & Signalization @ North Policy Road	CON	2014	2017
	10075E	NH 111 Bypass	Construct West End Of Bypass Including Local Roadways, North Section Of NH 28 & Eastern Connection	CON	2005	2007
	10075F	NH 28 / NH 111	Reconstruction Of Intersection @ Lake Street And Shadow Lake Road	CON	2012	2017

APPENDIX D-4: DETAILED EMISSIONS TABLES

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Manchester	NOx			VOC (kg)			VMT		
Town Name	ART	FREE	TOTAL	ART	FREE	TOTAL	ART	FREE	TOTAL
Epping	410.00	486.00	896.00	239.00	194.00	433.00	216224	189669	405893.47
Fremont	124.00		124.00	77.00		77.00	66996		66995.98
Northwood	330.00		330.00	191.00		191.00	175149		175149.10
Nottingham	351.00		351.00	198.00		198.00	182806		182806.06
Grand Total	**1,215**	**486**	**1,701**	**705**	**194**	**899**	**641,175**	**189,669**	**830,845**

Southern New Hampshire	NOx			VOC (kg)			VMT		
Town Name	ART	FREE	TOTAL	ART	FREE	TOTAL	ART	FREE	TOTAL
Atkinson	292.79		292.79	183.20		183.20	156948		156947.79
Brentwood	406.05	237.26	643.31	238.90	94.15	333.05	217065	92321	309386.22
Danville	150.74		150.74	89.28		89.28	79858		79858.10
East Kingston	76.76		76.76	46.53		46.53	41254		41254.01
Hampstead	427.57		427.57	258.31		258.31	228355		228355.04
Hampton Falls	144.22	620.10	764.32	90.55	247.00	337.55	77451	242760	320211.84
Kingston	721.87		721.87	435.26		435.26	388194		388193.54
Newton	95.60		95.60	57.38		57.38	51147		51146.80
Plaistow	510.65		510.65	317.32		317.32	271024		271024.40
Salem	1188.17	1113.74	2301.92	758.47	594.83	1353.30	629048	530865	1159912.65
Sandown	117.08		117.08	71.29		71.29	62882		62882.33
Seabrook	249.05	474.73	723.78	159.53	192.46	352.00	130120	188149	318269.44
South Hampton	28.10		28.10	15.61		15.61	14476		14476.15
Windham	845.56	1114.63	1960.19	587.16	542.20	1129.36	412722	505710	918432.58
Grand Total	**5,254**	**3,560**	**8,815**	**3,309**	**1,671**	**4,979**	**2,760,545**	**1,559,806**	**4,320,351**

Seacoast	NOx			VOC (kg)			VMT		
Town Name	ART	FREE	TOTAL	ART	FREE	TOTAL	ART	FREE	TOTAL
Barrington	569.72		569.72	326.45		326.45	299483		299482.77
Dover	780.74	1543.41	2324.15	485.11	762.15	1247.26	415262	708643	1123905.43
Durham	576.48	9.43	585.91	338.55	5.29	343.84	302336	4652	306988.47
Exeter	357.00	787.49	1144.49	225.09	316.74	541.84	188119	309997	498115.52
Farmington	321.32		321.32	179.62		179.62	165450		165450.23
Greenland	243.65	1051.50	1295.15	144.58	435.07	579.66	129413	424952	554364.79
Hampton	617.08	1021.96	1639.05	383.20	436.61	819.81	326729	415523	742251.79
Kensington	142.05		142.05	85.82		85.82	76415		76415.07
Lee	634.16	1.08	635.24	363.49	0.57	364.06	333891	500	334390.74
Madbury	156.57		156.57	91.94		91.94	83219		83219.25
Middleton	60.37		60.37	35.71		35.71	32256		32255.83
Milton	544.43	3.91	548.34	293.87	2.22	296.09	276752	1953	278704.85
New Castle	10.78		10.78	6.58		6.58	5865		5865.19
New Durham	124.64		124.64	65.81		65.81	61959		61958.76
Newfields	99.35		99.35	62.35		62.35	52701		52701.21
Newington	78.72	434.20	512.92	50.06	232.97	283.03	41290	209794	251084.20
Newmarket	179.12		179.12	109.97		109.97	96161		96160.69
North Hampton	271.22	1029.73	1300.95	162.17	442.90	605.08	145755	422395	568149.56
Portsmouth	1134.84	1428.78	2563.62	719.34	678.94	1398.28	588285	639585	1227870.21
Rochester	1250.82	632.38	1883.20	739.52	319.86	1059.38	661923	291756	953678.96
Rollinsford	143.79		143.79	79.61		79.61	73704		73703.99
Rye	220.42		220.42	133.56		133.56	118689		118689.37
Somersworth	391.69		391.69	240.72		240.72	209941		209940.75
Strafford	98.68		98.68	56.56		56.56	51674		51673.72
Stratham	387.37	171.06	558.43	229.37	71.16	300.53	206521	68443	274963.26
Grand Total	**9,395**	**8,115**	**17,510**	**5,609**	**3,704**	**9,314**	**4,943,791**	**3,498,194**	**8,441,985**

2007

Manchester			**NOx**			**VOC (kg)**			**VMT**	
Town Name		ART	FREE	TOTAL	ART	FREE	TOTAL	ART	FREE	TOTAL
Epping	BUILD	272.00	304.00	576.00	159.00	119.00	278.00	239707	195369	435075.98
	NO BUILD	272.00	304.00	576.00	159.00	119.00	278.00	239255	195219	434474.00
Fremont	BUILD	84.00		84.00	52.00		52.00	75639		75638.67
	NO BUILD	84.00		84.00	52.00		52.00	75681		75681.00
Northwood		204.00		204.00	118.00		118.00	180434		180434.00
Nottingham		223.00		223.00	125.00		125.00	193295		193295.00
Grand Total	**BUILD**	**783**	**304**	**1,087**	**454**	**119**	**573**	**689,075**	**195,369**	**884,444**
	NO BUILD	**783**	**304**	**1,087**	**454**	**119**	**573**	**688,665**	**195,219**	**883,884**

Southern NH	**NOx**			**VOC (kg)**			**VMT**		
Town Name	ART	FREE	TOTAL	ART	FREE	TOTAL	ART	FREE	TOTAL
Atkinson	187.14		187.14	117.59		117.59	166985		166985.27
Brentwood	257.26	152.20	409.46	151.94	59.16	211.09	230220	97623	327843.16
Danville	98.88		98.88	58.47		58.47	87407		87407.20
East Kingston	52.09		52.09	31.53		31.53	46793		46792.58
Hampstead	273.86		273.86	166.45		166.45	244789		244789.21
Hampton Falls	92.44	385.58	478.02	58.09	150.60	208.69	83053	249103	332156.44
Kingston	455.45		455.45	276.05		276.05	409896		409895.98
Newton	65.19		65.19	39.11		39.11	58316		58315.94
Plaistow	327.85		327.85	203.65		203.65	290256		290255.72
Salem	693.52	681.24	1374.75	441.13	370.70	811.82	614397	556330	1170726.89
Sandown	75.51		75.51	45.92		45.92	67776		67775.62
Seabrook	151.02	293.31	444.33	96.46	116.72	213.18	131804	192024	323827.58
South Hampton	18.62		18.62	10.27		10.27	15933		15933.04
Windham	515.52	698.69	1214.20	360.13	345.68	705.81	415283	540010	955293.23
Grand Total	**3,264**	**2,211**	**5,475**	**2,057**	**1,043**	**3,100**	**2,862,908**	**1,635,089**	**4,497,998**

Seacoast	**NOx**			**VOC (kg)**			**VMT**		
Town Name	ART	FREE	TOTAL	ART	FREE	TOTAL	ART	FREE	TOTAL
Barrington	361.50		361.50	206.18		206.18	316483		316483.18
Dover	497.88	977.17	1475.05	308.96	492.48	801.44	442317	768427	1210744.79
Durham	359.74	5.54	365.28	210.63	3.19	213.82	314367	4721	319088.58
Exeter	227.73	502.19	729.92	143.30	199.81	343.11	200387	328759	529146.05
Farmington	205.21		205.21	114.53		114.53	176200		176199.96
Greenland	155.72	655.44	811.16	92.75	267.65	360.40	138161	439500	577660.60
Hampton	376.36	634.20	1010.56	233.14	267.21	500.35	332835	428732	761567.18
Kensington	92.08		92.08	55.66		55.66	82804		82803.58
Lee	401.59	0.78	402.36	230.48	0.40	230.88	353513	608	354121.57
Madbury	103.04		103.04	60.31		60.31	91325		91325.11
Middleton	38.68		38.68	22.80		22.80	34487		34486.93
Milton	342.06	2.41	344.47	182.55	1.41	183.96	288075	2081	290156.45
New Castle	6.45		6.45	3.95		3.95	5879		5879.04
New Durham	79.22		79.22	41.31		41.31	65096		65096.30
Newfields	66.32		66.32	41.75		41.75	58471		58471.49
Newington	54.41	267.21	321.62	34.39	147.91	182.30	48098	222259	270356.83
Newmarket	115.52		115.52	71.15		71.15	103486		103485.61
North Hampton	172.29	640.19	812.48	103.14	272.24	375.38	154830	437171	592000.86
Portsmouth	723.75	863.16	1586.91	457.62	412.13	869.75	626139	653341	1279479.79
Rochester	779.07	407.32	1186.39	459.20	209.12	668.32	688038	321768	1009805.78
Rollinsford	88.73		88.73	48.56		48.56	75326		75326.17
Rye	135.39		135.39	82.01		82.01	122005		122005.06
Somersworth	236.99		236.99	145.31		145.31	212421		212420.61
Strafford	67.11		67.11	38.21		38.21	58478		58477.57
Stratham	243.94	109.53	353.46	144.73	44.99	189.72	217399	72803	290201.99
Grand Total	**5,931**	**5,065**	**10,996**	**3,533**	**2,319**	**5,851**	**5,206,620**	**3,680,171**	**8,886,791**

2009

Manchester		**NOx**			**VOC (kg)**			**VMT**		
Town Name		ART	FREE	TOTAL	ART	FREE	TOTAL	ART	FREE	TOTAL
Epping	BUILD	229.00	247.00	476.00	133.00	100.00	233.00	250866	198258	449124.00
	NO BUILD	229.00	247.00	476.00	138.00	100.00	238.00	250486	198282	448768.00
Fremont	BUILD	72.00		72.00	46.00		46.00	80425		80425.00
	NO BUILD	72.00		72.00	46.00		46.00	80401		80401.00
Northwood		166.00		166.00	98.00		98.00	182781		182781.00
Nottingham		184.00		184.00	106.00		106.00	198063		198063.00
Grand Total	**BUILD**	**651**	**247**	**898**	**383**	**100**	**483**	**712,135**	**198,258**	**910,393**
	NO BUILD	**651**	**247**	**898**	**388**	**100**	**488**	**711,731**	**198,282**	**910,013**

Southern New Hampshire	**NOx**			**VOC (kg)**			**VMT**		
Town Name	ART	FREE	TOTAL	ART	FREE	TOTAL	ART	FREE	TOTAL
Atkinson	149.08		149.08	95.78		95.78	165574		165574.40
Brentwood	210.66	125.32	335.97	127.84	50.56	178.40	234751	100320	335071.18
Danville	81.82		81.82	49.66		49.66	90002		90001.91
East Kingston	43.70		43.70	27.11		27.11	48834		48833.78
Hampstead	222.71		222.71	138.72		138.72	247658		247658.11
Hampton Falls	76.01	311.24	387.26	48.86	126.10	174.97	84991	250769	335759.62
Kingston	373.39		373.39	232.21		232.21	418234		418233.55
Newton	55.47		55.47	34.10		34.10	61762		61762.10
Plaistow	273.32		273.32	174.18		174.18	300635		300634.89
Salem	542.14	637.92	1180.06	352.26	317.96	670.21	598433	605928	1204361.72
Sandown	62.62		62.62	39.07		39.07	69975		69975.12
Seabrook	122.43	235.98	358.40	79.94	97.70	177.63	132862	193286	326148.25
South Hampton	15.58		15.58	8.86		8.86	16608		16608.34
Windham	417.09	596.83	1013.92	301.71	288.64	590.35	416699	554641	971339.96
Grand Total	**2,646**	**1,907**	**4,553**	**1,710**	**881**	**2,591**	**2,887,019**	**1,704,944**	**4,591,963**

Seacoast	**NOx**			**VOC (kg)**			**VMT**		
Town Name	ART	FREE	TOTAL	ART	FREE	TOTAL	ART	FREE	TOTAL
Barrington	300.00		300.00	176.00		176.00	327129		327129.26
Dover	419.99	802.41	1222.40	267.01	419.55	686.56	464347	791575	1255921.71
Durham	291.99	4.40	296.39	175.28	2.62	177.90	317419	4702	322121.63
Exeter	186.30	410.17	596.46	119.85	169.11	288.96	204013	334971	538983.99
Farmington	168.94		168.94	96.83		96.83	180469		180468.65
Greenland	127.46	523.45	650.91	77.79	223.91	301.70	140701	442859	583560.40
Hampton	303.47	510.72	814.20	192.36	223.27	415.63	333913	431746	765658.93
Kensington	76.08		76.08	47.14		47.14	85143		85143.01
Lee	328.02	0.63	328.65	193.83	0.33	194.17	359878	613	360490.25
Madbury	86.49		86.49	52.02		52.02	95445		95445.12
Middleton	31.97		31.97	19.33		19.33	35480		35480.32
Milton	279.33	1.97	281.31	153.25	1.19	154.44	292610	2141	294751.04
New Castle	7.09		7.09	4.44		4.44	8033		8032.61
New Durham	64.94		64.94	34.82		34.82	66394		66394.26
Newfields	54.34		54.34	34.98		34.98	59603		59602.58
Newington	45.48	217.51	262.99	29.38	124.77	154.15	50034	227157	277191.02
Newmarket	93.92		93.92	59.24		59.24	104679		104679.18
North Hampton	139.96	511.24	651.20	85.85	227.40	313.25	156488	440538	597025.98
Portsmouth	595.15	695.48	1290.64	384.72	344.18	728.90	640755	659839	1300593.45
Rochester	636.92	337.13	974.06	384.85	178.76	563.61	699865	333185	1033050.56
Rollinsford	71.95		71.95	40.42		40.42	75970		75970.16
Rye	109.85		109.85	68.14		68.14	123166		123166.22
Somersworth	193.94		193.94	121.78		121.78	216294		216293.57
Strafford	56.56		56.56	33.07		33.07	61345		61345.34
Stratham	198.51	89.22	287.74	120.83	37.96	158.79	220119	74011	294129.78
Grand Total	**4,869**	**4,104**	**8,973**	**2,973**	**1,953**	**4,926**	**5,319,292**	**3,743,337**	**9,062,629**

2017

Manchester		NOx			VOC (kg)			VMT		
Town Name		ART	FREE	TOTAL	ART	FREE	TOTAL	ART	FREE	TOTAL
Epping	BUILD	99.00	96.00	195.00	79.00	54.00	133.00	279602	206777	486379.00
	NO BUILD	99.00	96.00	195.00	79.00	54.00	133.00	280241	205865	486106.00
Fremont	BUILD	33.00		33.00	27.00		27.00	95668		95668.00
	NO BUILD	33.00		33.00	28.00		28.00	96652		96652.00
Northwood		67.00		67.00	52.00		52.00	192512		192512.00
Nottingham		77.00		77.00	58.00		58.00	215762		215762.00
Grand Total	**BUILD**	**276**	**96**	**372**	**216**	**54**	**270**	**783,544**	**206,777**	**990,321**
	NO BUILD	**276**	**96**	**372**	**217**	**54**	**271**	**785,167**	**205,865**	**991,032**

Southern New Hampshire	NOx			VOC (kg)			VMT		
Town Name	ART	FREE	TOTAL	ART	FREE	TOTAL	ART	FREE	TOTAL
Atkinson	61.10		61.10	51.37		51.37	175569		175568.74
Brentwood	87.51	49.76	137.27	70.06	27.82	97.88	253461	106598	360059.06
Danville	34.16		34.16	27.26		27.26	97674		97673.93
East Kingston	20.56		20.56	16.72		16.72	59536		59536.36
Hampstead	89.29		89.29	72.94		72.94	257636		257636.30
Hampton Falls	32.41	120.56	152.97	27.20	67.48	94.69	93782	259422	353204.08
Kingston	159.51		159.51	129.65		129.65	462116		462115.91
Newton	24.28		24.28	19.52		19.52	70044		70043.95
Plaistow	123.69		123.69	101.78		101.78	350658		350657.95
Salem	222.81	245.62	468.44	189.57	165.53	355.10	635641	619868	1255509.00
Sandown	27.78		27.78	22.67		22.67	80493		80493.19
Seabrook	48.32	90.87	139.20	41.30	51.94	93.24	135816	198997	334812.48
South Hampton	6.87		6.87	5.17		5.17	19106		19106.46
Windham	169.44	244.07	413.51	162.50	148.60	311.10	434777	565497	1000274.22
Grand Total	**1,108**	**751**	**1,859**	**938**	**461**	**1,399**	**3,126,309**	**1,750,382**	**4,876,692**

Seacoast	NOx			VOC (kg)			VMT		
Town Name	ART	FREE	TOTAL	ART	FREE	TOTAL	ART	FREE	TOTAL
Barrington	130.96		130.96	101.88		101.88	372424		372424.10
Dover	178.13	342.73	520.86	148.22	238.13	386.35	509763	892684	1402447.53
Durham	120.46	1.74	122.20	95.28	1.36	96.64	339773	4869	344642.08
Exeter	78.32	161.79	240.12	65.94	92.65	158.59	222055	355435	577489.70
Farmington	70.25		70.25	53.39		53.39	195870		195870.26
Greenland	51.90	202.34	254.24	41.85	119.71	161.57	148867	460128	608994.88
Hampton	121.08	197.87	318.95	100.55	118.54	219.08	344880	445673	790553.18
Kensington	33.04		33.04	26.79		26.79	95804		95804.07
Lee	136.64	0.33	136.97	106.36	0.23	106.59	389516	853	390368.44
Madbury	36.79		36.79	29.02		29.02	105374		105373.75
Middleton	13.69		13.69	10.84		10.84	39425		39425.05
Milton	114.33	0.89	115.22	83.38	0.70	84.08	313297	2526	315823.21
New Castle	2.73		2.73	2.24		2.24	8038		8037.88
New Durham	26.72		26.72	19.12		19.12	71605		71605.07
Newfields	22.85		22.85	19.26		19.26	64896		64895.68
Newington	13.40	105.39	118.79	11.33	76.10	87.44	38525	283727	322251.59
Newmarket	37.10		37.10	30.58		30.58	107151		107151.45
North Hampton	59.02	198.10	257.13	47.48	121.37	168.85	171172	457754	628925.45
Portsmouth	250.02	277.52	527.54	211.38	185.13	396.51	701753	696954	1398706.51
Rochester	264.89	151.83	416.72	210.36	103.74	314.10	756135	385876	1142010.39
Rollinsford	28.44		28.44	21.07		21.07	78141		78140.63
Rye	44.18		44.18	35.82		35.82	128481		128481.46
Somersworth	80.13		80.13	65.93		65.93	231235		231235.32
Strafford	26.13		26.13	20.08		20.08	73601		73600.62
Stratham	80.60	35.44	116.05	64.54	20.79	85.33	232165	78700	310865.42
Grand Total	**2,022**	**1,676**	**3,698**	**1,623**	**1,078**	**2,701**	**5,739,945**	**4,065,178**	**9,805,124**

2026

Manchester		NOx			VOC (kg)			VMT		
Town Name		ART	FREE	TOTAL	ART	FREE	TOTAL	ART	FREE	TOTAL
Epping	BUILD	59.00	49.00	108.00	65.00	40.00	105.00	318672	215239	533911.00
	NO BUILD	60.00	49.00	109.00	66.00	39.00	105.00	231979	213627	445606.00
Fremont	BUILD	21.00		21.00	24.00		24.00	115955		115955.00
	NO BUILD	21.00		21.00	24.00		24.00	117938		117938.00
Northwood		37.00		37.00	40.00		40.00	203952		203952.00
Nottingham		44.00		44.00	46.00		46.00	236874		236874.00
Grand Total	**BUILD**	**161**	**49**	**210**	**175**	**40**	**215**	**875,453**	**215,239**	**1,090,692**
	NO BUILD	**162**	**49**	**211**	**176**	**39**	**215**	**790,743**	**213,627**	**1,004,370**

Southern New Hampshire	NOx			VOC (kg)			VMT		
Town Name	ART	FREE	TOTAL	ART	FREE	TOTAL	ART	FREE	TOTAL
Atkinson	34.52		34.52	40.12		40.12	189414		189413.64
Brentwood	50.03	26.08	76.11	55.71	21.08	76.79	279625	114516	394141.36
Danville	19.98		19.98	22.01		22.01	109969		109969.46
East Kingston	12.84		12.84	14.32		14.32	71312		71311.92
Hampstead	49.71		49.71	56.25		56.25	275730		275730.07
Hampton Falls	19.14	60.23	79.37	22.13	48.80	70.93	105755	266393	372147.69
Kingston	90.83		90.83	102.18		102.18	504094		504093.88
Newton	15.70		15.70	17.34		17.34	86981		86980.87
Plaistow	74.38		74.38	85.00		85.00	402042		402041.57
Salem	124.86	125.83	250.69	146.82	120.27	267.09	678004	634527	1312530.91
Sandown	16.80		16.80	18.86		18.86	93468		93468.25
Seabrook	26.19	45.42	71.62	31.03	37.54	68.56	139936	204015	343950.49
South Hampton	4.17		4.17	4.34		4.34	22407		22406.63
Windham	95.15	123.13	218.27	132.12	107.79	239.91	455164	578369	1033533.20
Grand Total	**634**	**381**	**1,015**	**748**	**335**	**1,084**	**3,413,899**	**1,797,821**	**5,211,720**

Seacoast	NOx			VOC (kg)			VMT		
Town Name	ART	FREE	TOTAL	ART	FREE	TOTAL	ART	FREE	TOTAL
Barrington	75.02		75.02	80.51		80.51	411475		411475.18
Dover	99.00	188.41	287.42	113.54	186.92	300.46	541841	986075	1527915.72
Durham	65.56	0.88	66.45	71.52	0.97	72.49	355491	4877	360367.90
Exeter	44.63	85.07	129.70	51.95	70.56	122.50	241768	384349	626117.00
Farmington	40.20		40.20	42.26		42.26	217110		217109.98
Greenland	28.98	103.29	132.27	32.27	87.67	119.94	159351	476573	635924.19
Hampton	65.57	99.94	165.51	75.14	86.77	161.91	356804	460595	817398.63
Kensington	19.34		19.34	21.56		21.56	107825		107824.84
Lee	76.66	0.18	76.84	82.76	0.17	82.93	422450	904	423353.99
Madbury	21.04		21.04	22.89		22.89	116273		116273.04
Middleton	8.02		8.02	8.72		8.72	44450		44450.22
Milton	62.97	0.51	63.48	63.05	0.57	63.62	334269	2858	337127.02
New Castle	1.42		1.42	1.59		1.59	8020		8019.81
New Durham	14.94		14.94	14.80		14.80	77945		77944.58
Newfields	13.57		13.57	15.93		15.93	73161		73160.76
Newington	8.55	56.80	65.35	9.98	58.28	68.26	46709	304798	351507.03
Newmarket	20.67		20.67	23.51		23.51	114167		114167.25
North Hampton	34.37	101.35	135.72	38.17	89.27	127.44	191757	474379	666135.78
Portsmouth	140.42	143.36	283.78	164.10	135.48	299.58	753537	720363	1473900.72
Rochester	147.01	85.60	232.61	160.55	83.55	244.10	808161	436605	1244765.90
Rollinsford	15.06		15.06	15.31		15.31	80052		80051.55
Rye	24.22		24.22	27.00		27.00	135527		135526.99
Somersworth	42.60		42.60	48.13		48.13	235547		235546.59
Strafford	16.54		16.54	17.43		17.43	89846		89846.41
Stratham	44.39	18.71	63.11	48.99	15.94	64.93	245987	85460	331447.20
Grand Total	**1,131**	**884**	**2,015**	**1,252**	**816**	**2,068**	**6,169,520**	**4,337,838**	**10,507,358**

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APPENDIX D-5: INDIVIDUAL OFF-MODEL ANALYSIS WORKSHEETS

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PROGRAMMED RAIL STATION PARKING EXPANSIONS IN DURHAM & EXETER
Portland to Boston Passenger Rail Service

2007	Road Length	Vehicle trips/day	VMT Reductions	Speed (MPH)	Emission Factors		Emissions Saved	
					HC	NOx	HC	NOx
Durham-MA Border	23.1	86	1,987	45	0.626	0.657	1.24	1.31
Durham-ME Border	13.2	14	185	40	0.641	0.645	0.12	0.12
Exeter-MA Border	11.1	90	1,002	61	0.595	0.710	0.24	0.23
Exeter-ME Border	18.4	6	106	61	0.595	0.710	0.03	0.02
Emissions saved		**196**	**3,279**				**1.63**	**1.68**

2009	Road Length	Vehicle trips/day	VMT Reductions	Speed (MPH)	Emission Factors		Emissions Saved	
					HC	NOx	HC	NOx
Durham-MA Border	23.1	86	1,987	45	0.512	0.527	1.02	1.05
Durham-ME Border	13.2	14	185	40	0.523	0.518	0.10	0.10
Exeter-MA Border	11.1	90	1,002	61	0.489	0.573	0.49	0.57
Exeter-ME Border	18.4	6	106	61	0.489	0.573	0.05	0.06
Emissions saved		**196**	**3,279**				**1.66**	**1.78**

2017	Road Length	Vehicle trips/day	VMT Reductions	Speed (MPH)	Emission Factors		Emissions Saved	
					HC	NOx	HC	NOx
Durham-MA Border	23.1	86	1,987	45	0.244	0.211	0.48	0.42
Durham-ME Border	13.2	14	185	40	0.248	0.207	0.05	0.04
Exeter-MA Border	11.1	90	1,002	61	0.238	0.231	0.24	0.23
Exeter-ME Border	18.4	6	106	61	0.238	0.231	0.03	0.02
Emissions saved		**196**	**3,279**				**0.79**	**0.71**

2026	Road Length	Vehicle trips/day	VMT Reductions	Speed (MPH)	Emission Factors		Emissions Saved	
					HC	NOx	HC	NOx
Durham-MA Border	23.1	86	1,987	45	0.170	0.131	0.34	0.26
Durham-ME Border	13.2	14	185	40	0.174	0.128	0.03	0.02
Exeter-MA Border	11.1	90	1,002	61	0.165	0.143	0.17	0.14
Exeter-ME Border	18.4	6	106	61	0.165	0.143	0.02	0.02
Emissions saved		**196**	**3,279**				**0.55**	**0.44**

Assumptions

Assumes addition of 100 pay per day parking spaces at UNH station and a 50% utilization rate for these
Assumes addition of 62 spaces at Exeter station, 90% utilization, and an average occupancy per space of 1.25
Distribution of trips from Exeter and Durham stations based on distribution of ridership between October 2003 -
Assumed annual ridership growth of 2%/year from NNEPRA
Average daily speeds between segments are calculated from the Seacoast MPO traffic model.
Mobile 6.2b emissions factor for composite of light duty passenger vehicles derived by NHDES.
Total emissions saved in kg/day = VMT * emission factors for each analysis year.
Emissions Factors updated for October, 2006 Conformity Determination

Downeaster Service Analysis

Project Description:
Implementation of Base Downeaster Rail Service with Four Round Trips per Day
Air Quality Analysis based on avoided automobile trips resulting from mode switch from automobile to train

Assumptions from NNEPRA:
Base ridership of 275,576 for 2007 from NNEPRA
An estimated 92.12 gallons/day is used by the locomotives (23.03 gal/round trip * 4 round trips/day)

	2007	2009 (6)	2017 (6)	2026 (6)
Projected ridership	275,576	286,709	335,926	393,590
Riders per weekday	**829**	**863**	**1,011**	**1,185**

Emission Impact 2007

	Trip Distrib by Link (10/03-7/04)	Link as % of All Trips	Avoided Trips/Day FY 07 (2)	VMT/Trip in NH (3) (Miles)	Total VMT in NH FY 07	Avg. Link Speed	Factor Type	Auto Emission Factors HC (5)	Auto Emission Factors NOx (5)	Reduction Emission HC (kg/day)	Emission NOx (kg/day)
Boston-North - Portland	75,548	36.76%	277.2	18.5	5,129	61	Freeway	0.593	0.712	3.04	3.65
Boston-North - Exeter	33,016	16.07%	121.2	11.1	1,345	61	Freeway	0.593	0.712	0.80	0.96
Boston-North - Durham	17,591	8.56%	64.6	23.1	1,491	45	Arterial	0.626	0.657	0.93	0.98
Boston-North - Wells	16,654	8.10%	61.1	18.5	1,131	61	Freeway	0.593	0.712	0.67	0.80
Boston-North - Dover	16,024	7.80%	58.8	25.4	1,494	37	Arterial	0.650	0.640	0.97	0.96
Boston-North - Saco	13,796	6.71%	50.6	18.5	937	61	Freeway	0.593	0.712	0.56	0.67
Boston-North - Haverhill	3,306	1.61%	12.1	0	0					0.00	0.00
Dover - Portland	2,489	1.21%	9.1	5.1	47	45	Arterial	0.626	0.657	0.03	0.03
Portland - Woburn	2,474	1.20%	9.1	18.5	168	61	Freeway	0.593	0.712	0.10	0.12
Haverhill - Portland	2,373	1.15%	8.7	18.5	161	61	Freeway	0.593	0.712	0.10	0.11
Durham - Portland	2,329	1.13%	8.5	13.2	113	40	Arterial	0.641	0.645	0.07	0.07
Exeter - Portland	2,169	1.06%	8.0	18.4	146	61	Freeway	0.593	0.712	0.09	0.10
Durham - Exeter	1,907	0.93%	7.0	12.1	85	40	Arterial	0.641	0.645	0.05	0.05
Boston-North - Old Orchard Beach	1,855	0.90%	6.8	18.5	126	61	Freeway	0.593	0.712	0.07	0.09
Durham - Haverhill	1,082	0.53%	4.0	23.1	92	45	Arterial	0.626	0.657	0.06	0.06
Durham - Saco	1,069	0.52%	3.9	13.2	52	40	Arterial	0.641	0.645	0.03	0.03
Durham - Woburn	1,046	0.51%	3.8	23.1	89	45	Arterial	0.626	0.657	0.06	0.06
Portland - Wells	907	0.44%	3.3	0	0					0.00	0.00
Haverhill - Saco	715	0.35%	2.6	18.5	49	61	Freeway	0.593	0.712	0.03	0.03
Dover - Exeter	642	0.31%	2.4	25.6	60	37	Arterial	0.650	0.640	0.04	0.04
Exeter - Woburn	611	0.30%	2.2	11.1	25	55	Freeway	0.593	0.712	0.01	0.02
Old Orchard Beach - Portland	566	0.28%	2.1	0	0					0.00	0.00
Portland - Saco	466	0.23%	1.7	0	0					0.00	0.00
Wells - Woburn	454	0.22%	1.7	18.5	31	61	Freeway	0.593	0.712	0.02	0.02
Dover - Saco	321	0.16%	1.2	5.1	6	45	Arterial	0.626	0.657	0.00	0.00
All other markets (1)	6,082	2.96%	22.3	4	89	40	Arterial	0.641	0.645	0.06	0.06
	205,492	**100.00%**	**754**		**12,863**				Totals	7.79	8.93
Train Emissions (kg/day) (4)										0.90	16.31
Total Emission saved (kg/day)										**6.89**	**-7.38**

(1) "All other markets" assumes 4 miles in NH, average speed of 40.
(2) Divided by 1.1 to account for average riders per car.
(3) From Rockingham Planning Commission/Seacoast MPO
(4) Train emissions = (Emission Factor*92.12gal/day)/1000
Fleet Average Emission Factors for all Locomotives
From EPA's Emission Factors for Locomotives, December 1997 EPA420-F-97-051

Year	HC (g/gal)	CO (g/gal)	NOx (g/gal)	PM (g/gal)
2007	9.8	27.4	177	6.2

(5) Vehicle emission factors are from MOBILE6.2 for Composite light duty vehicles, derived 2/23/05 provided by NHDES
(6) Assumes 2% annual growth in passenger trips. This compares to 2.5% average annual growth in commute trips to Boston from Seacoast MPO communities during the period of 1990-2000

Downeaster Service Analysis

Project Description:
Implementation of Base Downeaster Rail Service with Four Round Trips per Day
Air Quality Analysis based on avoided automobile trips resulting from mode switch from automobile to train

Assumptions from NNEPRA:
Base ridership of 275,576 for 2007 from NNEPRA
An estimated 92.12 gallons/day is used by the locomotives (23.03 gal/round trip * 4 round trips/day)

	2007	2009 (6)	2017 (6)	2026 (6)
Projected ridership	275,576	286,709	335,926	393,590
Riders per weekday	**829**	**863**	**1,011**	**1,185**

Emission Impact 2009

	Trip Distrib by Link (10/03-7/04)	Link as % of All Trips	Avoided Trips/Day FY 09 (2)	VMT/Trip in NH (3) (Miles)	Total VMT in NH FY 09	Avg. Link Speed	Factor Type	Auto Emission Factors HC (5)	Auto Emission Factors NOx (5)	Reduction Emission HC (kg/day)	Reduction Emission NOx (kg/day)
Boston-North - Portland	75,548	36.76%	288.4	18.5	5,336	61	Freeway	0.489	0.573	2.61	3.06
Boston-North - Exeter	33,016	16.07%	126.0	11.1	1,399	61	Freeway	0.489	0.573	0.68	0.80
Boston-North - Durham	17,591	8.56%	67.2	23.1	1,551	45	Arterial	0.512	0.527	0.79	0.82
Boston-North - Wells	16,654	8.10%	63.6	18.5	1,176	61	Freeway	0.489	0.573	0.58	0.67
Boston-North - Dover	16,024	7.80%	61.2	25.4	1,554	37	Arterial	0.530	0.514	0.82	0.80
Boston-North - Saco	13,796	6.71%	52.7	18.5	974	61	Freeway	0.489	0.573	0.48	0.56
Boston-North - Haverhill	3,306	1.61%	12.6	0	0					0.00	0.00
Dover - Portland	2,489	1.21%	9.5	5.1	48	45	Arterial	0.512	0.527	0.02	0.03
Portland - Woburn	2,474	1.20%	9.4	18.5	175	61	Freeway	0.489	0.573	0.09	0.10
Haverhill - Portland	2,373	1.15%	9.1	18.5	168	61	Freeway	0.489	0.573	0.08	0.10
Durham - Portland	2,329	1.13%	8.9	13.2	117	40	Arterial	0.523	0.518	0.06	0.06
Exeter - Portland	2,169	1.06%	8.3	18.4	152	61	Freeway	0.489	0.573	0.07	0.09
Durham - Exeter	1,907	0.93%	7.3	12.1	88	40	Arterial	0.523	0.518	0.05	0.05
Boston-North - Old Orchard Beach	1,855	0.90%	7.1	18.5	131	61	Freeway	0.489	0.573	0.06	0.08
Durham - Haverhill	1,082	0.53%	4.1	23.1	95	45	Arterial	0.512	0.527	0.05	0.05
Durham - Saco	1,069	0.52%	4.1	13.2	54	40	Arterial	0.523	0.518	0.03	0.03
Durham - Woburn	1,046	0.51%	4.0	23.1	92	45	Arterial	0.512	0.527	0.05	0.05
Portland - Wells	907	0.44%	3.5	0	0					0.00	0.00
Haverhill - Saco	715	0.35%	2.7	18.5	50	61	Freeway	0.489	0.573	0.02	0.03
Dover - Exeter	642	0.31%	2.5	25.6	63	37	Arterial	0.530	0.514	0.03	0.03
Exeter - Woburn	611	0.30%	2.3	11.1	26	61	Freeway	0.489	0.573	0.01	0.01
Old Orchard Beach - Portland	566	0.28%	2.2	0	0					0.00	0.00
Portland - Saco	466	0.23%	1.8	0	0					0.00	0.00
Wells - Woburn	454	0.22%	1.7	18.5	32	61	Freeway	0.489	0.573	0.02	0.02
Dover - Saco	321	0.16%	1.2	5.1	6	45	Arterial	0.512	0.527	0.00	0.00
All other markets (1)	6,082	2.96%	23.2	4	93	40	Arterial	0.523	0.518	0.05	0.05
	205,492	**100.00%**	**785**		**13,382**				Totals	6.66	7.47
Train Emissions (kg/day) (4)										0.87	15.50
Total Emission saved (kg/day)										**5.80**	**-8.03**

(1) "All other markets" assumes 4 miles in NH, average speed of 40.
(2) Divided by 1.1 to account for average riders per car.
(3) Trip segment distances from Rockingham Planning Commission/Seacoast MPO
(4) Train emissions = (Emission Factor*92.12gal/day)/1000
Assumes current Tier 0 locomotive for 2007 & 2009, and replacement with Tier 2 locomotive prior to 2017
From EPA's Emission Factors for Locomotives, December 1997 EPA420-F-97-051

Year	HC (g/gal)	CO (g/gal)	NOx (g/gal)	PM (g/gal)
2009	9.4	27.4	168.3	5.9

(5) Vehicle emission factors are from MOBILE6.2 for Composite light duty vehicles, derived 2/23/05 provided by NHDES
(6) Assumes 2% annual growth in passenger trips. This compares to 2.5% average annual growth in commute trips to Boston from Seacoast MPO communities during the period of 1990-2000

Downeaster Service Analysis

Project Description:
Implementation of Base Downeaster Rail Service with Four Round Trips per Day
Air Quality Analysis based on avoided automobile trips resulting from mode switch from automobile to train

Assumptions from NNEPRA:
Base ridership of 275,576 for 2007 from NNEPRA
An estimated 92.12 gallons/day is used by the locomotives (23.03 gal/round trip * 4 round trips/day)

	2007	2009 (6)	2017 (6)	2026 (6)
Projected ridership	275,576	286,709	335,926	393,590
Riders per weekday	**829**	**863**	**1,011**	**1,185**

Emission Impact 2017

	Trip Distrib by Link (10/03-7/04)	Link as % of All Trips	Avoided Trips/Day FY 17 (2)	VMT/Trip in NH (3) (Miles)	Total VMT in NH FY 17	Avg. Link Speed	Factor Type	Auto Emission Factors HC (5)	Auto Emission Factors NOx (5)	Reduction Emission HC (kg/day)	Reduction Emission NOx (kg/day)
Boston-North - Portland	75,548	36.76%	337.9	18.5	6,252	61	Freeway	0.238	0.231	1.49	1.44
Boston-North - Exeter	33,016	16.07%	147.7	11.1	1,639	61	Freeway	0.238	0.231	0.39	0.38
Boston-North - Durham	17,591	8.56%	78.7	23.1	1,818	45	Arterial	0.244	0.211	0.44	0.38
Boston-North - Wells	16,654	8.10%	74.5	18.5	1,378	61	Freeway	0.238	0.231	0.33	0.32
Boston-North - Dover	16,024	7.80%	71.7	25.4	1,821	37	Arterial	0.251	0.205	0.46	0.37
Boston-North - Saco	13,796	6.71%	61.7	18.5	1,142	61	Freeway	0.238	0.231	0.27	0.26
Boston-North - Haverhill	3,306	1.61%	14.8	0	0					0.00	0.00
Dover - Portland	2,489	1.21%	11.1	5.1	57	45	Arterial	0.244	0.211	0.01	0.01
Portland - Woburn	2,474	1.20%	11.1	18.5	205	61	Freeway	0.238	0.231	0.05	0.05
Haverhill - Portland	2,373	1.15%	10.6	18.5	196	61	Freeway	0.238	0.231	0.05	0.05
Durham - Portland	2,329	1.13%	10.4	13.2	138	40	Arterial	0.248	0.207	0.03	0.03
Exeter - Portland	2,169	1.06%	9.7	18.4	179	61	Freeway	0.238	0.231	0.04	0.04
Durham - Exeter	1,907	0.93%	8.5	12.1	103	40	Arterial	0.248	0.207	0.03	0.02
Boston-North - Old Orchard Beach	1,855	0.90%	8.3	18.5	154	61	Freeway	0.238	0.231	0.04	0.04
Durham - Haverhill	1,082	0.53%	4.8	23.1	112	45	Arterial	0.244	0.211	0.03	0.02
Durham - Saco	1,069	0.52%	4.8	13.2	63	40	Arterial	0.248	0.207	0.02	0.01
Durham - Woburn	1,046	0.51%	4.7	23.1	108	45	Arterial	0.244	0.211	0.03	0.02
Portland - Wells	907	0.44%	4.1	0	0					0.00	0.00
Haverhill - Saco	715	0.35%	3.2	18.5	59	61	Freeway	0.238	0.231	0.01	0.01
Dover - Exeter	642	0.31%	2.9	25.6	74	37	Arterial	0.251	0.205	0.02	0.02
Exeter - Woburn	611	0.30%	2.7	11.1	30	61	Freeway	0.238	0.231	0.01	0.01
Old Orchard Beach - Portland	566	0.28%	2.5	0	0					0.00	0.00
Portland - Saco	466	0.23%	2.1	0	0					0.00	0.00
Wells - Woburn	454	0.22%	2.0	18.5	38	61	Freeway	0.238	0.231	0.01	0.01
Dover - Saco	321	0.16%	1.4	5.1	7	45	Arterial	0.244	0.211	0.00	0.00
All other markets (1)	6,082	2.96%	27.2	4	109	40	Arterial	0.248	0.207	0.03	0.02
	205,492	**100.00%**	**919**		**15,680**				Totals	3.77	3.52
Train Emissions (kg/day) (4)										0.50	9.49
Total Emission saved (kg/day)										**3.28**	**-5.97**

(1) "All other markets" assumes 4 miles in NH, average speed of 40.
(2) Divided by 1.1 to account for average riders per car.
(3) Trip segment distances from Rockingham Planning Commission/Seacoast MPO
(4) Train emissions = (Emission Factor*92.12gal/day))/1000
Assumes current Tier 0 locomotive for 2007 & 2009, and replacement with Tier 2 locomotive prior to 2017
From EPA's Emission Factors for Locomotives, December 1997 EPA420-F-97-051

Year	HC (g/gal)	CO (g/gal)	NOx (g/gal)	PM (g/gal)
2017	5.4	26.6	103	3.6

(5) Vehicle emission factors are from MOBILE6.2 for Composite light duty vehicles, derived 2/23/05 provided by NHDES
(6) Assumes 2% annual growth in passenger trips. This compares to 2.5% average annual growth in commute trips to Boston from Seacoast MPO communities during the period of 1990-2000

Downeaster Service Analysis

Project Description:
Implementation of Base Downeaster Rail Service with Four Round Trips per Day
Air Quality Analysis based on avoided automobile trips resulting from mode switch from automobile to train

Assumptions from NNEPRA:
Base ridership of 275,576 for 2007 from NNEPRA
An estimated 92.12 gallons/day is used by the locomotives (23.03 gal/round trip * 4 round trips/day)

	2007	2009 (6)	2017 (6)	2026 (6)
Projected ridership	275,576	286,709	335,926	393,590
Riders per weekday	**829**	**863**	**1,011**	**1,185**

Emission Impact 2026

	Trip Distrib by Link (10/03-7/04)	Link as % of All Trips	Avoided Trips/Day FY 25 (2)	VMT/Trip in NH (3) (Miles)	Total VMT in NH FY 25	Avg. Link Speed	Factor Type	Auto Emission Factors HC (5)	Auto Emission Factors NOx (5)	Reduction Emission HC (kg/day)	Reduction Emission NOx (kg/day)
Boston-North - Portland	75,548	36.76%	395.9	18.5	7,325	61	Freeway	0.165	0.143	1.21	1.05
Boston-North - Exeter	33,016	16.07%	173.0	11.1	1,921	61	Freeway	0.165	0.143	0.32	0.27
Boston-North - Durham	17,591	8.56%	92.2	23.1	2,130	45	Arterial	0.170	0.131	0.36	0.28
Boston-North - Wells	16,654	8.10%	87.3	18.5	1,615	61	Freeway	0.165	0.143	0.27	0.23
Boston-North - Dover	16,024	7.80%	84.0	25.4	2,133	37	Arterial	0.177	0.126	0.38	0.27
Boston-North - Saco	13,796	6.71%	72.3	18.5	1,338	61	Freeway	0.165	0.143	0.22	0.19
Boston-North - Haverhill	3,306	1.61%	17.3	0	0					0.00	0.00
Dover - Portland	2,489	1.21%	13.0	5.1	67	45	Arterial	0.170	0.131	0.01	0.01
Portland - Woburn	2,474	1.20%	13.0	18.5	240	61	Freeway	0.165	0.143	0.04	0.03
Haverhill - Portland	2,373	1.15%	12.4	18.5	230	61	Freeway	0.165	0.143	0.04	0.03
Durham - Portland	2,329	1.13%	12.2	13.2	161	40	Arterial	0.174	0.129	0.03	0.02
Exeter - Portland	2,169	1.06%	11.4	18.4	209	61	Freeway	0.165	0.143	0.03	0.03
Durham - Exeter	1,907	0.93%	10.0	12.1	121	40	Arterial	0.174	0.128	0.02	0.02
Boston-North - Old Orchard Beach	1,855	0.90%	9.7	18.5	180	61	Freeway	0.165	0.143	0.03	0.03
Durham - Haverhill	1,082	0.53%	5.7	23.1	131	45	Arterial	0.170	0.131	0.02	0.02
Durham - Saco	1,069	0.52%	5.6	13.2	74	40	Arterial	0.174	0.128	0.01	0.01
Durham - Woburn	1,046	0.51%	5.5	23.1	127	45	Arterial	0.170	0.131	0.02	0.02
Portland - Wells	907	0.44%	4.8	0	0					0.00	0.00
Haverhill - Saco	715	0.35%	3.7	18.5	69	61	Freeway	0.165	0.143	0.01	0.01
Dover - Exeter	642	0.31%	3.4	25.6	86	37	Arterial	0.177	0.126	0.02	0.01
Exeter - Woburn	611	0.30%	3.2	11.1	36	61	Freeway	0.165	0.143	0.01	0.01
Old Orchard Beach - Portland	566	0.28%	3.0	0	0					0.00	0.00
Portland - Saco	466	0.23%	2.4	0	0					0.00	0.00
Wells - Woburn	454	0.22%	2.4	18.5	44	61	Freeway	0.165	0.143	0.01	0.01
Dover - Saco	321	0.16%	1.7	5.1	9	45	Arterial	0.170	0.131	0.00	0.00
All other markets (1)	6,082	2.96%	31.9	4	128	40	Arterial	0.174	0.128	0.02	0.02
	205,492	**100.00%**	**1,077**		**18,371**				Totals	3.07	2.55
Train Emissions (kg/day) (4)										0.50	9.49
Total Emission saved (kg/day)										**2.58**	**-6.94**

(1) "All other markets" assumes 4 miles in NH, average speed of 40.
(2) Divided by 1.1 to account for average riders per car.
(3) From Rockingham Planning Commission/Seacoast MPO
(4) Train emissions = (Emission Factor*92.12gal/day)/1000
Assumes current Tier 0 locomotive for 2007 & 2009, and replacement with Tier 2 locomotive prior to 2017
From EPA's Emission Factors for Locomotives, December 1997 EPA420-F-97-051

	HC	CO	NOx	PM
2025	5.4	26.6	103	3.6

(5) Vehicle emission factors are from MOBILE6.2 for Composite light duty vehicles, derived 2/23/05 provided by NHDES
(6) Assumes 2% annual growth in passenger trips. This compares to 2.5% average annual growth in commute trips to Boston from Seacoast MPO communities during the period of 1990-2000

Spaulding Turnpike Express Bus Service & Exit 9 Park & Ride

02-29CM & 04-32CM

AQ Analysis developed by NHDOT, reviewed and adjusted by Seacoast MPO 3/05, updated 10/06

Notes & Assumptions:

1. Emission reductions are estimated from Automobile trips replaced
2. Service will consist of weekday peak hour transit trips with 30 minute headways. Buses would stop at park and rides along the Spaulding Turnpike corridor as well as at Pease International Tradeport, and the Portsmouth Intermodal facility. Assume 1% growth in ridership/year
3. Average Driving distances assume 65% of vehicles are driving from Dover (12 mi.), 35% are driving from Rochester (21.1 mi.) and all have a destination of Pease Tradeport.
4. Determined from Regional Traffic Model that Average Link Speed is ~33 mph north of the tolls and ~15 mph south of the tolls.
5. Assume 75% of cars in Park and Rides are not there overnight.
6. Emission reductions are expressed as kilograms per day, calculated by multiplying daily VMT Reductions by Emission factors & dividing by 1000 - ((VMT Reduction * Emission factor) / 1000)
7. Motor vehicle emission factors from Mobile 6.2 Composite Park and Ride emissions from NHDES
8. Emission increase from proposed new bus routes
   Round trip mileage estimates based on proposed routing
   Daily mileage = round trip mileage * round trips per weekday
   Used Mobile 6.2 Urban Bus factors provided by NHDES
9. NOx increase = VMT * NOx Factors VOC increase = VMT * VOC Factors
   Emission reductions are expressed as kilograms per day, calculated by multiplying daily VMT
   Reductions by Emission factors & dividing by 1000 - ((VMT Reduction * Emission factor) / 1000)
10. Total emission reductions = emission reductions from auto trips replaced + emission increase from proposed new bus routes

Emissions Analysis

1. Emission reduction from Automobile trips replaced

Rochester to Portsmouth		2007	2009	2017	2026
Est. Riders per year (from COAST)		93,850	108,288	166,040	223,792
Op days per year		256	256	256	256
Est. Riders per day		367	423	649	874
Weighted Ave. Trip length		15.19	15.19	15.19	15.19
VMT saved per day		5,567	6,423	9,849	13,275
% trips replacing autos		100%	100%	100%	100%
Avg vehicle occupancy		1.1	1.1	1.1	1.1
VMT saved (per weekday)		5,061	5,839	8,954	12,068
Emission Factors @33mph	11.49	Miles at 33 mph average link speed			
VOC (gm/mile)		0.674	0.548	0.258	0.182
NOx (gm/mile)		0.649	0.519	0.206	0.127
Emission Factors @15mph	3.7	Miles at 15 mph average link speed			
VOC (gm/mile)		0.866	0.698	0.329	0.245
NOx (gm/mile)		0.660	0.527	0.208	0.129

Emission Reductions (kgs/day)

	VOC	**4.0125**	**3.7547**	**2.7114**	**2.6197**
	NOx	**3.6278**	**3.3462**	**2.0337**	**1.6923**

2. Emission increase from proposed new bus routes

		2007	2009	2017	2026
Round Trip Mileage		41.2	41.2	41.2	41.2
Round trips per day		12	12	12	12
Daily Mileage		494	494	494	494
Urban Bus Emission Factors @33 mph					
VOC (gm/mile	16.9	0.479	0.383	0.235	0.22
NOx (gm/mile)		12.465	10.684	4.175	1.361
Urban Bus Emission Factors @15 mph					
VOC (gm/mile	3.7	0.867	0.693	0.426	0.398
NOx (gm/mile)		15.990	13.711	5.369	1.748
Urban Bus Emission Factors @33 mph (return trip)					
VOC (gm/mile	20.6	0.479	0.383	0.235	0.22
NOx (gm/mile)		12.465	10.684	4.175	1.361

Total Emissions from Bus Service (kgs/day) (expressed in Part 3 as a negative number)

VOC	**0.2540**	**0.2031**	**0.1247**	**0.1167**
NOx	**6.3192**	**5.4166**	**2.1171**	**0.6901**

3. Net Emission Reductions for Express Bus Service (kgs/day)

	2007	2009	2017	2026
VMT	**5,072**	**5,929**	**9,354**	**12,780**
VOC	**3.7584**	**3.5516**	**2.5867**	**2.5031**
NOx	**-2.6914**	**-2.0704**	**-0.0835**	**1.0023**

4. Additional Benefits from Park and Ride

Park and Ride	Spaces	Transit?	2001 Summer	2003 Summer	Average Usage	Percent
Hooksett	45	No	15	11	13	28.9%
Nashua 7E	50	No	15	21	18	36.0%
Bow	60	No	50	54	52	86.7%
Windham	150	No	62	43	53	35.0%
Nashua 8	350	No	3	10	7	1.9%
	Average without transit					**37.7%**
Nashua 5W	108	Yes	36	61	49	44.9%
Londonderry	471	Yes	388	357	373	79.1%
Portsmouth PDA	975	Yes	593	624	609	62.4%
	Average with transit					**62.1%**

Data from NH Rideshare:

Difference in percentage of use when Transit service is available: **24.5%**

Park and Ride capacity:	280	
Park and Ride users only:	68	
Daily bus users	119	**188**

VMTs saved = (Park & Ride only users * 12 miles) * percentage of non-overnight vehicles = 616

Emissions reduced due to SOV removal

Weelday VMT Subtracted = 616

	2007	2009	2017	2026
"Ramp Up" Factor	75%	75%	100%	100%
VMT Red.	462	462	616	616
VOC (kg/day)	0.3336	0.2705	0.1699	0.1218
NOx (kg/day)	0.3011	0.2407	0.1272	0.0785

5. Net Benefits of Express Bus Service & Park & Ride Together

	2007	2009	2017	2026
VMT	**5,534**	**6,391**	**9,970**	**13,396**
VOC	**4.0920**	**3.8221**	**2.7566**	**2.6249**
NOx	**-2.3903**	**-1.8297**	**0.0437**	**1.0808**

Air Quality Analysis
Interstate 95/Spaulding Tpk Incident Management System
Seabrook-Portsmouth (11151Z)

A. DETERMINE REGIONAL FREEWAY VOC AND NOx EMISSIONS
ADT, VMT and Emissions on links from Seacoast Regional Traffic Model

	2007	2009	2017	2026	
ADT **[VOL_I]**	26,847	27,330	31,059	32,054	Average ADT for Affected links taken from Seacoast Regional Traffic Model.
Length **[L]**	88.44	88.44	88.44	88.44	Length of Spaulding Tpk, Interstate 95, and surface road links (in Miles) including mainline from MA to ME state lines, on ramps, NH 101 interchange, NH 16 interchange, and other immediate approach links.
VMT **[VOL_T]**	3,644,043	3,695,883	4,095,575	4,186,095	VMT from above links from Regional Traffic Model output
VOC [E_{BV}]	**2289.477**	**1924.615**	**1089.278**	**788.930**	kg/day Area emissions from Regional Traffic Model
NOx [E_{BN}]	**5101.506**	**4125.021**	**1696.872**	**863.553**	kg/day Area emissions from Regional Traffic Model
EFF*	0.75	0.75	0.75	0.75	Effectiveness of project at reducing incident related congestion*
Emissions*	0.049	0.049	0.049	0.049	% of Emissions caused by Nonrecurring congestion
E_{CVOC}	112.1843562	94.30613	53.374621	38.6575735	VOC Emissions due to Nonrecurring Congestion
E_{CNOx}	249.973772	202.12604	83.146747	42.3140736	NOx Emissions due to Nonrecurring Congestion
Ave Speed	56.77		54.71	52.47	Average Speed on Links from Regional Traffic Model (Not Used)

3491118	VMT
662.461	VOC
754.751	NOx
23276.4	ADT

B. DETERMINE FREEWAY EMISSIONS DUE TO NON-RECURRING CONGESTION
Assumptions

	2007		2009		2017		2026	
	E_B	E_C	E_B	E_C	E_B	E_C	E_B	E_C
VOC	2289.476657	112.18436	1924.6149	94.3061302	1089.278	53.374621	788.93007	38.65757
NOx	5101.505551	249.97377	4125.0213	202.126044	1696.8724	83.146747	863.55252	42.31407

AREA	MILES	DISTRIBUTION
SEA	70.4867	79.7%
SNH	17.9533	20.3%
TOTAL MI	88.44	

$E_C = E_B$ *.049 Emissions from nonrecurring congestion is equal to the regional emissions (E_B) multiplied by the percent of emissions that are due to nonrecurring congestion. This has been determined to be 4.9% [See notes below]

C. ESTIMATE DAILY VOC/NOx REDUCTIONS

Daily Reduction VOC/NOx = [L * VOL_I * (E_C/VOL_T) * EFF]

SEA PORTION

YEAR	Est Emissions from model VOC	NOx	L	VOL_I	% emissions from Incidents	E_C VOC	E_C NOx	VOL_T	EFF	Emissions Savings VOC	Emissions Savings NOx
2007	2289.476657	5101.5056	19.61	26,847	0.049	112.18	249.97	3,644,043	0.75	**12.16**	**27.09**
2009	1924.614903	4125.0213	19.61	27,330	0.049	94.31	202.13	3,695,883	0.75	**10.26**	**21.98**
2017	1089.277973	1696.8724	19.61	31,059	0.049	53.37	83.15	4,095,575	0.75	**5.95**	**9.27**
2026	788.9300724	863.55252	19.61	32,054	0.049	38.66	42.31	4,186,095	0.75	**4.35**	**4.77**

SOUTHERN PORTION

YEAR	Est Emissions from model VOC	NOx	L	VOL_I	% emissions from Incidents	E_C VOC	E_C NOx	VOL_T	EFF	Emissions Savings VOC	Emissions Savings NOx
2007	2289.476657	5101.5056	5.27	26,847	0.049	112.18	249.97	3,644,043	0.75	**3.27**	**7.28**
2009	1924.614903	4125.0213	5.27	27,330	0.049	94.31	202.13	3,695,883	0.75	**2.76**	**5.91**
2017	1089.277973	1696.8724	5.27	31,059	0.049	53.37	83.15	4,095,575	0.75	**1.60**	**2.49**
2026	788.9300724	863.55252	5.27	32,054	0.049	38.66	42.31	4,186,095	0.75	**1.17**	**1.28**

9/18/2002 Air Quality Analysis by David Walker using methodology from FHWA Southern Resource Center document "Off-Model Air Quality Analysis: A Compendium of Practice", page 18. http://www.fhwa.dot.gov/resourcecenters/southern/offmodel.pdf.

* Estimates of effectiveness based on implementation of Incident detection and response system that includes motorist assistance. Percent of emissions due to nonrecurring congestion and effectiveness rates taken from source listed above.

Nov-04 Updated to reflect M6.2 emissions factors, updated model output, and to merge Spaulding Tpk and I-95 systems into single analysis

Salem Adaptive Signal Control System
Air Quality Analysis

Signal Delay Analysis - Build and No Build

Intersection		No Build 2004 (Sec/Veh)	No Build 2009	Delay/Vehicle - Build Conditio 2009	2015	2017	2026
NH 28 (Broadway)	Staples Drive	12.1	52.5	13.5	15.7	16.5	20.7
NH 28 (Broadway)	Hampshire Rd	65.2	99.0	14.4	17.7	19.0	25.8
NH 28 (Broadway)	Lawrence Rd/Hampshire Rd.	18.4	33.0	14.6	16.6	17.3	21.0
NH 28 (Broadway)	Circuit City/State Liquor Store	15.8	22.5	9.6	11	11.5	14.1
NH 28 (Broadway)	Pattee Rd	11.1	12.5	7.8	9.4	10.0	13.2
NH 28 (Broadway)	Kelly Rd	15.3	20.9	22.3	20.1	19.4	16.6
NH 28 (Broadway)	Best Buy Plaza	14.3	15.1	11.2	12.2	12.6	14.3
NH 28 (Broadway)	Home Depot Plaza	16.7	19.4	13.3	13.4	13.4	13.6
NH 28 (Broadway)	Target Plaza	7.4	6.8	8.0	9.7	10.3	13.8
NH 28 (Broadway)	Cluff Crossing Rd.	29.9	34.2	30.7	36	38.0	48.2
NH 28 (Broadway)	Rockingham Park Blvd/Veterans Mem. Pkwy	42.1	65.9	35.7	45.1	48.8	69.2
NH 28 (Broadway)	Post Office Drive	15.0	25.7	24.0	24.6	24.8	25.7
NH 28 (Broadway)	NH 97/Main Street	99.1	182.3	135.9	33.3	34.7	42.0
NH 28 (Broadway)	Old Rockingham Rd.	8.1	10.5	8.9	9.8	10.1	11.7
NH 28 (Broadway)	Walmart Drive	11.4	12.9	16.2	17	17.3	18.6
NH 28 (Broadway)	NH 111/Lake Street	178.4	257.5	188.4	32.3	33.7	40.7
NH 97 (Main St)	School St/Bridge St	364.9	506.2	27.7	52.5	65.0	169.5
NH 97 (Main St)	Geremonty Drive	28.6	60.1	25.3	32.6	35.5	51.9
NH 97 (Main St)	NH 38	14.6	17.8	15.0	15.2	15.3	15.6
NH 97 (Main St)	North/South Policy St	44.2	66.4	41.7	43.9	44.7	48.2
NH 97 (Main St)	I-93 Northbound Ramps	50.8	79.6	47.2	19.5	22.2	39.8
NH 97 (Main St)	I-93 Southbound Ramps	15.0	35.0	20.2	33.8	40.1	86.9
NH 97 (Main St)	Keewaydin Drive	144.4	203.1	99.4	15.3	17.4	31.2
NH 97 (Main St)	Stiles Rd	40.4	59.7	53.3	33.5	38.1	68.4
NH 38	Stiles Rd	16.4	76.7	25.7	33.7	36.9	55.4
NH 38	South Policy Rd	25.7	47.9	39.0	48.1	51.6	70.7
NH 38	Enterprise Rd/Mall Driveway	10.0	15.0	11.4	11.8	11.9	12.6
NH 38	Mall Rd.	8.3	125.8	12.5	13	13.2	14.0
Mall Rd	Race Track	12.9	26.1	24.4	18.6	19.7	25.8
Mall Rd	Rockingham Park Blvd Ramp	19.0	29.8	20.7	24.8	26.3	34.5
Rockingham Pk Blvd	Mall Rd.	12.4	19.2	14.2	15.8	16.4	19.2
Rockingham Pk Blvd	Race Track Drive	5.3	14.1	9.0	10.7	11.3	14.7
South Policy Street	Cluff Crossing Rd.	45.1	64.8	30.5	36.7	39.0	51.5
Cluff Crossing Rd	Rockingham Mall Drive	26.2	21.0	23.7	27.2	28.5	35.0
	Average Delay per vehicle	**42.5**	**68.8**	**32.2**	**23.8**	**25.6**	**36.9**

Intersection		Reductions in Delay/Vehicle Under Build Scenario 2009	2015	2017	2026	PM Peak Hour Traffic Volumes 2004	2009	2015	2017	2026
NH 28 (Broadway)	Staples Drive	39.0	36.8	36.0	31.8	2510	3690	3420	3516	3985
NH 28 (Broadway)	Hampshire Rd	84.6	81.3	80.0	73.2	2880	4510	3850	3959	4487
NH 28 (Broadway)	Lawrence Rd/Hampshire Rd.	18.4	16.4	15.7	12.0	2880	4510	3850	3959	4487
NH 28 (Broadway)	Circuit City/State Liquor Store	12.9	11.5	11.0	8.4	2500	4200	3410	3506	3973
NH 28 (Broadway)	Pattee Rd	4.7	3.1	2.5	-0.7	2530	4170	3440	3537	4008
NH 28 (Broadway)	Kelly Rd	-1.4	0.8	1.5	4.3	2600	4200	3550	3650	4137
NH 28 (Broadway)	Best Buy Plaza	3.9	2.9	2.5	0.8	2540	4210	3300	3393	3845
NH 28 (Broadway)	Home Depot Plaza	6.1	6.0	6.0	5.8	1580	4250	2010	2067	2343
NH 28 (Broadway)	Target Plaza	-1.2	-2.9	-3.5	-7.0	2280	4070	2660	2735	3100
NH 28 (Broadway)	Cluff Crossing Rd.	3.5	-1.8	-3.8	-14.0	3070	5670	4070	4185	4743
NH 28 (Broadway)	Rockingham Park Blvd/Veterans Mem. Pkwy	30.2	20.8	17.1	-3.3	3340	7800	6330	6508	7375
NH 28 (Broadway)	Post Office Drive	1.7	1.1	0.9	0.0	2260	4070	3430	3527	3997
NH 28 (Broadway)	NH 97/Main Street	46.4	149.0	147.6	140.3	3270	4930	4420	4545	5151
NH 28 (Broadway)	Old Rockingham Rd.	1.6	0.7	0.4	-1.2	1940	3420	2610	2684	3042
NH 28 (Broadway)	Walmart Drive	-3.3	-4.1	-4.4	-5.7	2120	3800	2780	2858	3239
NH 28 (Broadway)	NH 111/Lake Street	69.1	225.2	223.8	216.8	2620	3090	3320	3414	3869
NH 97 (Main St)	School St/Bridge St	478.5	453.7	441.2	336.7	2760	3010	3420	3516	3985
NH 97 (Main St)	Geremonty Drive	34.8	27.5	24.6	8.2	2010	1820	2540	2612	2960
NH 97 (Main St)	NH 38	2.8	2.6	2.5	2.2	3270	4930	4420	4545	5151
NH 97 (Main St)	North/South Policy St	24.7	22.5	21.7	18.2	2470	2110	3420	3516	3985
NH 97 (Main St)	I-93 Northbound Ramps	32.4	60.1	57.4	39.8	2420	1660	3100	3187	3612
NH 97 (Main St)	I-93 Southbound Ramps	14.8	1.2	-5.1	-51.9	1860	1030	2850	2930	3321
NH 97 (Main St)	Keewaydin Drive	103.7	187.8	185.7	171.9	1640	550	2080	2139	2424
NH 97 (Main St)	Stiles Rd	6.4	26.2	21.6	-8.7	1640	520	2080	2139	2424
NH 38	Stiles Rd	51.0	43.0	39.8	21.3	1560	2430	2510	2581	2925
NH 38	South Policy Rd	8.9	-0.2	-3.7	-22.8	2250	3660	3600	3702	4195
NH 38	Enterprise Rd/Mall Driveway	3.6	3.2	3.1	2.4	1000	2560	1980	2036	2307
NH 38	Mall Rd.	113.3	112.8	112.6	111.8	740	1790	1580	1625	1842
Mall Rd	Race Track	1.7	7.5	6.4	0.3	1630	4810	2980	3064	3472
Mall Rd	Rockingham Park Blvd Ramp	9.1	5.0	3.5	-4.7	1630	4810	2980	3064	3472
Rockingham Pk Blvd	Mall Rd.	5.0	3.4	2.8	0.0	3340	6470	5020	5162	5850
Rockingham Pk Blvd	Race Track Drive	5.1	3.4	2.8	-0.6	2980	5370	4430	4555	5162
South Policy Street	Cluff Crossing Rd.	34.3	28.1	25.8	13.3	1750	2310	2510	2581	2925
Cluff Crossing Rd	Rockingham Mall Drive	-2.7	-6.2	-7.5	-14.0	1470	2430	1900	1954	2214
	Average	**36.6**	**45.0**	**43.2**	**31.9**	**2275**	**3614**	**3231**	**3322**	**3765**

Salem Adaptive Signal Control System
Air Quality Analysis

Intersection		Total Delay - No Build 2009	Total Delay - No Build 2017	Total Delay - No Build 2026	Total Delay - Build 2009	Total Delay - Build 2017	Total Delay - Build 2026	Delay Reductions under Build 2009	Delay Reductions under Build 2017	Delay Reductions under Build 2026
NH 28 (Broadway)	Staples Drive	193725.0	179550.0	184590.0	49815.0	58050.2	82514.8	143910.0	121499.8	102075.2
NH 28 (Broadway)	Hampshire Rd	446490.0	381150.0	391941.0	64944.0	75063.5	115935.3	381546.0	306086.5	276005.7
NH 28 (Broadway)	Lawrence Rd/Hampshire Rd.	148830.0	127050.0	130647.0	65846.0	68592.8	94250.2	82984.0	58457.2	36396.8
NH 28 (Broadway)	Circuit City/State Liquor Store	94500.0	76725.0	78885.0	40320.0	40356.3	56092.0	54180.0	36368.7	22793.0
NH 28 (Broadway)	Pattee Rd	52125.0	43000.0	44212.5	32526.0	35381.3	53041.6	19599.0	7618.7	-8829.1
NH 28 (Broadway)	Kelly Rd	87780.0	74195.0	76285.0	93660.0	70868.4	68735.7	-5880.0	3326.6	7549.3
NH 28 (Broadway)	Best Buy Plaza	63571.0	49830.0	51234.3	47152.0	42591.6	54871.8	16419.0	7238.4	-3637.5
NH 28 (Broadway)	Home Depot Plaza	82450.0	38994.0	40099.8	56525.0	27767.0	31830.3	25925.0	11227.0	8269.5
NH 28 (Broadway)	Target Plaza	27676.0	18088.0	18598.0	32560.0	28289.4	42810.5	-4884.0	-10201.4	-24212.5
NH 28 (Broadway)	Cluff Crossing Rd.	193914.0	139194.0	143127.0	174069.0	158873.9	228642.3	19845.0	-19679.9	-85515.3
NH 28 (Broadway)	Rockingham Park Blvd/Veterans Mem. Pkwy	514020.0	417147.0	428877.2	278460.0	317292.8	510548.7	235560.0	99854.2	-81671.5
NH 28 (Broadway)	Post Office Drive	104599.0	88151.0	90643.9	97680.0	87481.3	102879.7	6919.0	669.7	-12235.8
NH 28 (Broadway)	NH 97/Main Street	898739.0	805766.0	828553.5	669987.0	157864.6	216283.0	228752.0	647901.4	612270.5
NH 28 (Broadway)	Old Rockingham Rd.	35910.0	27405.0	28182.0	30438.0	27161.5	35570.1	5472.0	243.5	-7388.1
NH 28 (Broadway)	Walmart Drive	49020.0	35862.0	36868.2	61560.0	49373.0	60150.4	-12540.0	-13511.0	-23282.2
NH 28 (Broadway)	NH 111/Lake Street	795675.0	854900.0	879105.0	582156.0	115019.8	157575.2	213519.0	739880.2	721529.8
NH 97 (Main St)	School St/Bridge St	1523662.0	1731204.0	1779799.2	83377.0	228437.8	675564.4	1440285.0	1502766.2	1104234.8
NH 97 (Main St)	Geremonty Drive	109382.0	152654.0	156981.2	46046.0	92659.5	153586.8	63336.0	59994.5	3394.4
NH 97 (Main St)	NH 38	87754.0	78676.0	80901.0	73950.0	69389.7	80219.7	13804.0	9286.3	681.3
NH 97 (Main St)	North/South Policy St	140104.0	227088.0	233462.4	87987.0	157020.4	192233.2	52117.0	70067.6	41229.2
NH 97 (Main St)	I-93 Northbound Ramps	132136.0	246760.0	253685.2	78352.0	70753.1	143744.4	53784.0	176006.9	109940.8
NH 97 (Main St)	I-93 Southbound Ramps	36050.0	99750.0	102550.0	20806.0	117572.6	288439.9	15244.0	-17822.6	-185889.9
NH 97 (Main St)	Keewaydin Drive	111705.0	422448.0	434430.9	54670.0	37259.0	75689.0	57035.0	385189.0	358741.9
NH 97 (Main St)	Stiles Rd	31044.0	124176.0	127698.3	27716.0	81580.1	165724.2	3328.0	42595.9	-38025.9
NH 38	Stiles Rd	186381.0	192517.0	197962.7	62451.0	95202.9	162006.8	123930.0	97314.1	35955.9
NH 38	South Policy Rd	175314.0	172440.0	177325.8	142740.0	190959.7	296386.1	32574.0	-18519.7	-119060.3
NH 38	Enterprise Rd/Mall Driveway	38400.0	29700.0	30540.0	29184.0	24302.6	28999.3	9216.0	5397.4	1540.7
NH 38	Mall Rd.	225182.0	198764.0	204425.0	22375.0	21403.0	25731.2	202807.0	177361.0	178693.8
Mall Rd	Race Track	125541.0	77778.0	79970.4	117364.0	60472.9	89488.2	8177.0	17305.1	-9517.8
Mall Rd	Rockingham Park Blvd Ramp	143338.0	88804.0	91307.2	99567.0	80705.1	119926.1	43771.0	8098.9	-28618.9
Rockingham Pk Blvd	Mall Rd.	124224.0	96384.0	99110.4	91874.0	84514.5	112414.5	32350.0	11869.5	-13304.1
Rockingham Pk Blvd	Race Track Drive	75717.0	62463.0	64225.5	48330.0	51632.0	75850.9	27387.0	10831.0	-11625.4
South Policy Street	Cluff Crossing Rd.	149688.0	162648.0	167248.8	70455.0	100749.5	150705.8	79233.0	61898.5	16543.0
Cluff Crossing Rd	Rockingham Mall Drive	51030.0	39900.0	41034.0	57591.0	55646.0	77520.7	-6561.0	-15746.0	-36486.7
	Total Delay/Vehicle (in seconds)	7257685.0	7563178.0	7776533.4	3594542.0	2982304.9	4827989.0	3663143.0	4580873.1	2948544.4
							Delay in Hours	**1017.54**	**1272.46**	**819.04**

Emissions Factors @ 2.5 mph	2009	2017	2026
VOC (gm/mile)	4.142	1.961	1.633
NOx (gm/mile)	1.735	0.671	0.374
VOC (gm/hour)	**10.355**	**4.903**	**4.083**
NOx (gm/hour)	**4.338**	**1.678**	**0.935**

	2009	2017	2026
VOC Savings (g)	**10,536.62**	**6,238.26**	**3,343.73**
NOx Savings (g)	**4,413.58**	**2,134.56**	**765.80**
VOC Savings (kg)	**10.54**	**6.24**	**3.34**
NOx Savings (kg)	**4.41**	**2.13**	**0.77**

Notes & Assumptions:

1. Emissions reduction is based on the projected reduction in vehicle delay after implementation of the traffic responsive signal controls for **Weekday PM Peak period** only. The air quality and congestion benefits of this system would be seen during the AM Peak period
2. Traffic Volume and Delay information for all intersections taken from ***Route 28 Corridor ITS Project Baseline Conditions and Initial Findings Report,*** Town of Salem, April, 2005
3. For all future no-build years the estimated 2009 delays from the Rute 28 Corridor ITS Project Baseline Conditions and Initial Findings Report are used. This likely underestimates the dealy for years beyond 2009
4. 2017 and 2026 volumes are based on growing the 2015 projections from the study in note #2 by 1.4% per year.
5. Increases in delays at some intersections for 2017 and 2026 were calculated based on the average growth in delay from other intersections on the same roadway
6. Emission factors are from Mobile 6 and converted from gm/mile to gm/hour by multiplying by 2.5 mph.
7. Emission reductions are computed from the difference in delay-induced emissions from these segments of highway before and after adaptive signal control is in place (No-Build condition - Build condition).
8. NOx reduction = (NOx emmissions without adaptive signal control) - (NOx emissions with adaptive signal control)
9. VOC reduction = (VOC emmissions without adaptive signal control) - (VOC emissions with adaptive signal control)
10. Emission reductions are expressed in kilograms
11. At this time, no benefits are being assumed for 2007
12. Benefits from this system related to incidents on I-93 are included within the analysis for the I-93 Incident Management System project analysis

Air Quality Analysis
Salem Employee Trip Reduction Integration Project (SE-TRIP)
SPW-CM-1

Bicycle/Pedestrian Route

Emission Reductions (kgs/day)	2007	2009	2017	2025
VOC	0.50	0.42	0.21	0.16
NOx	0.50	0.41	0.17	0.11
VMT	776	796	843	886

Transportation Management Association

Emission Reductions (kgs/day)	2007	2009	2017	2026
VOC	0.86	1.08	0.51	0.36
NOx	0.85	1.05	0.42	0.26
VMT	1327.32	2045.22	2045.22	2045.22

Commuter Transit Service

Emission Reductions (kgs/day)	2007	2009	2017	2026
VOC	0.57	0.46	0.21	0.14
NOx	-1.48	-1.30	-1.61	-0.11
VMT	1938.00	2154.07	2270.27	2654.92

Totals

Emission Reductions (kgs/day)	2007	2009	2017	2026
VOC	1.93	1.97	0.93	0.66
NOx	-0.13	0.16	-1.02	0.26
VMT	4041	4995	5158	5586

Updated 10/06 By David Walker

Air Quality Analysis
Salem Employee Trip Reduction Integration Project
Part A - Salem Downtown Pedestrian Corridor
SPW-CM-1A

Emissions Analysis				
	2007	**2009**	**2017**	**2026**
Bike/ped trips per day mid-summer	**776**	**796**	**843**	**886**
Auto trip replacement rate	0.50	0.5	0.50	0.50
Average trip length	2.0	2.0	2.0	2.0
VMT saved (per weekday)	**776**	**796**	**843**	**886**
Average speed (MPH)	37	37	37	37
Emission Factors @37 mph				
VOC (gm/mile)	0.650	0.530	0.251	0.177
NOx (gm/mile)	0.640	0.514	0.205	0.126
Emission Reductions (kgs/day)	**2007**	**2009**	**2017**	**2026**
VOC	0.50	0.42	0.21	0.16
NOx	0.50	0.41	0.17	0.11

Notes & Assumptions:

Daily trail use estimates from Alta Planning & Design report to N 2009
Assumes that average bicycle/ped trip equals project length (2 miles)
Assumes 50% of trail user trips will replace automobile trips
VMT saved = trips replaced per day X average trip length
Average auto speed of 35 m.p.h. based upon speed limits
LDV Composite emission factors from NHDES from Mobile 6.2
Total emission reductions = emission factors X estimated weekday VMT saved.

Air Quality Analysis
Salem Employee Trip Reduction Integration Project
Part B - Derry-Salem Commuter Bus Service
SPW-CM-1B

Automobile Emissions Analysis				
	2007	**2009**	**2017**	**2025**
Avoided auto trips	124	137	144	166
Average trip length	17.0	17.0	17.0	17.0
VMT saved (per weekday)	**2108**	**2324**	**2440**	**2825**
Emission Factors @37 mph				
VOC (gm/mile)	0.65	0.53	0.251	0.177
NOx (gm/mile)	0.64	0.514	0.205	0.127
Emission Reductions (kgs/day)				
VOC	0.650	0.530	0.251	0.177
NOx	0.640	0.514	0.205	0.126
Diesel bus VMT added (34 miles * 5 runs)	**170**	**170**	**170**	**170**
Emission Factors @32 mph				
VOC (gm/mile)	0.491	0.393	0.242	0.226
NOx (gm/mile)	12.463	10.68	10.68	1.36
Emission Increase (kgs/day)				
VOC	-0.08	-0.07	-0.04	-0.04
NOx	-2.12	-1.82	-1.82	-0.23
Emission Reductions (kgs/day)				
VOC	**0.57**	**0.46**	**0.21**	**0.14**
NOx	**-1.48**	**-1.30**	**-1.61**	**-0.11**

Notes & Assumptions:

Ridership assumptions based on Greater Derry-Salem Regional Transit Plan
Assumes 5% annual increase ridership during 3 years of pilot project
Assumes average trip length based route proposed in Derry-Salem transit plan
VMT saved = trips replaced per day X average trip length
Average auto speed of 37 m.p.h. based upon speed limits
LDV Composite emission factors from NHDES from Mobile 6.2
Total emission reductions = emission factors X estimated weekday VMT saved.
Assumes use of buses from MVRTA, with costs covering only operating expenses

Air Quality Analysis
Salem Employee Trip Reduction Integration Project
Part C - Transportation Management Association (TMA) Development
SPW-CM-1C

Establish a Transportation Management Association (TMA) to promote alternative commutes and establish commuter benefits for employees in Salem.

Automobile Emissions Analysis

	2007	2009	2017	2026
Projected commuters to Salem	18,962	19,478	19,478	19,478
Avoided auto trips (0.5% in 2007, 0.75% in 2010)	190	292	292	292
Average trip length	7.0	7.0	7.0	7.0
VMT saved (per weekday)	**1327**	**2045**	**2045**	**2045**
Average speed (MPH)	37	37	37	37
Emission Factors @37 mph				
VOC (gm/mile)	0.65	0.53	0.251	0.177
NOx (gm/mile)	0.64	0.514	0.205	0.126
Emission Reductions (kgs/day)	**2007**	**2009**	**2017**	**2026**
VOC	0.86	1.08	0.51	0.36
NOx	0.85	1.05	0.42	0.26

Notes & Assumptions:

Assumes commutes to Salem will increase at 1990-2000 rate of 0.9%/year

Assumes that by 2010 TMA will achieve 0.75% of commute trips shifting to alternative modes. 2007 assumes 0.5% of commute trips switching to alternative modes

Assumes average trip length based on weighted average commute distance from top 15 commute origin towns in 2000

VMT saved = trips replaced per day X average trip length

Average auto speed of 37 m.p.h. based upon speed limits

LDV Composite emission factors from NHDES from Mobile 6.2

Total emission reductions = emission factors X estimated weekday VMT saved.

I-93 Bus Service Analysis

I-93 Bus Service

Implement expanded bus service on I-93 between Manchester and Boston and new commuter incentive program along I-93 corridor to promote carpool, vanpool, and transit. Purchase fourteen (14) commuter coaches and provide three years operating support for commuter bus startup, including marketing program.
Commuter incentive program will provide financial incentives to new carpool, vanpool and transit users.

Assumptions

51-passenger coaches, 50% load weekdays 25% load weekends
18 round trips per weekday from both Exit 4/2 and Exit 5
9 round trips per weekend day from Exit 4/2 and 5
251 weekdays, 114 weekend days of service
Exit 5 service nonstop, Exit 4&2 ridership split 3/4 Exit 4, 1/4 Exit 2
1/2 of the bus route is congested speed, 1/2 is uncongested speed.
There are 1.1 persons per passenger vehicle.
Assume 75% of cars in Park and Rides are not there overnight.
Passenger Car Emission factors are a composite of Park&Ride vehicle factors from Mobile 6.2 (DES 6/04)
Bus Emission factors are a "Urban Bus" vehicle factors from Mobile 6.2, from DES 6/21/04

<u>Sample Calculation:</u>
Passenger Trips = Number of coaches * Number of one-way trips * Number of people riding
i.e. Weekday Passenger Trips for Exit 5 = 51 * 18 * 2 * 0.5 = 918
VMTs = Coaches * One-way trips * Number of people riding * One-way Distance / Persons per car
i.e. VMTs for weekday for Exit 5 = 51 * 18 * 2 * 0.5 * 15.6 / 1.1 = 13,019

Passenger Trips = Number of coaches * load * number of round trips * miles

	Miles to State Line	Weekday Passenger-Trips	Weekday Daily NH VMTs	Weekday Bus VMTs
Exit 5	15.6	918	13,019	562
Exit 4	No longer in current plan.			
Exit 2	3.4	230	780	**122**
Per-day totals		1,148	13,799	**684**

Commuter incentive program

Assumption: 500 new participants in carpool/vanpools, a minimum of 250 SOVs removed from I-93
Carpool split reflects bus split between Exits: 125 @ Exit 5, 94 @ Exit 4, 31 @ Exit 2.

Total VMT saved /day 5,754

I-93 Bus Service Analysis

Emissions reduced due to SOV removal

Weekday VMT Subtracted = 19,553

			Emission factors (gm/mile) VOC	Emission factors (gm/mile) NOx	Emission Reductions (kg/day) VOC	Emission Reductions (kg/day) NOx
Year: 2007	Congested Speed	32	0.679	0.650	13.28	12.71
Year: 2009	Congested Speed	32	0.553	0.520	10.81	10.17
Year: 2017	Congested Speed	32	0.260	0.206	5.08	4.03
Year: 2026	Congested Speed	32	0.184	0.127	3.60	2.48

Emissions added due to bus

Weekday VMT Added = **684**

			Emission factors (gm/mile) VOC	Emission factors (gm/mile) NOx	Emission Reductions (kg/day) VOC	Emission Reductions (kg/day) NOx
Year: 2007	Congested Speed	32	0.491	12.488	0.17	4.27
	Uncongested Speed	53	0.344	17.169	0.12	5.87
Year: 2009	Congested Speed	32	0.393	10.704	0.13	3.66
	Uncongested Speed	53	0.275	14.723	0.09	5.04
Year: 2017	Congested Speed	32	0.242	4.183	0.08	1.43
	Uncongested Speed	53	0.169	5.768	0.06	1.97
Year: 2026	Congested Speed	32	0.226	1.363	0.08	0.47
	Uncongested Speed	53	0.158	1.878	0.05	0.64

Estimated SOV removal far exceeds lot capacity

Example - Exit 5 Spaces occupied by:

459 Bus users
125 Commuter incentive program users
117 Other users
701 Total daily SOVs assumed removed
480 Capacity of lot
432 Capacity of lot for day use
(assumes 10% overnight users, while analysis assumes 25% overnight)

Presumably there will be some kiss and ride drop-offs, but 270 at this lot alone?

Net Benefits (kg/day)

Year	VOC	NOx
2007	12.99	2.57
2009	10.58	1.47
2017	4.94	0.62
2026	3.47	1.37

I-93 Bus Service Analysis

Additional Benefits from Park and Ride

From NH Rideshare:

Park and Ride	Spaces	Transit?	2001 Summer Use	2003 Summer Use	Ave. Usage	Percent Used
Hooksett	45	No	15	11	13	28.9%
Nashua 7E	50	No	15	21	18	36.0%
Bow	60	No	50	54	52	86.7%
Windham	150	No	62	43	53	35.0%
Nashua 8	350	No	3	10	7	1.9%
	No Average					**37.7%**
Nashua 5W	108	Yes	36	61	49	44.9%
Londonderry	471	Yes	388	357	373	79.1%
Portsmouth PDA	975	Yes	593	624	609	62.4%
	Yes Average					**62.1%**

Difference in percentage of use when Transit service is available: **24.5%**

Exit 2 Park and Ride capacity:	430	**Exit 2 Park and Ride use only:**	105
Exit 3 Park and Ride capacity:	500	**Exit 3 Park and Ride use only:**	122
Exit 5 Park and Ride capacity:	480	**Exit 5 Park and Ride use only:**	117

VMTs saved = (Exit 2 users * 15.6 miles + Exit 3 users * 11.8 miles + Exit 5 users * 3.4 miles) * Percentage of Non-overnight vehicles = 2,612

Emissions reduced due to SOV removal

Weekday VMT Subtracted = 2,612

	"Ramp Up" factor	Congested Speed	Emission factors (gm/mile) VOC	NOx	Emission Reductions (kg/day) VOC	NOx
Year: 2007	75%	32	0.679	0.650	0.60	0.57
Year: 2009	85%	32	0.553	0.520	0.55	0.52
Year: 2017	100%	32	0.260	0.206	0.30	0.24
Year: 2026	100%	32	0.184	0.127	0.22	0.15

1. The likelihood of substantial use beyond the incentive program is slim. Those commuters who would use the lot even without the incentive will still take the incentive, leaving limited incentive funding to attract new users who wouldn't otherwise take part. Any extra use will likely be non-commuters.

Net Benefits (kg/day)

Year	VMTs	VOC	NOx
2007	19748	13.59	3.14
2009	19865	11.14	1.99
2017	20041	5.25	0.87
2026	20041	3.68	1.52

2. Use from Exit 3 P&R removed for 2007 as it will not be built yet
3. All buses in commute direction being full, including non-peak hour buses, seems unlikely

EMISSIONS ANALYSIS FOR I-93 ITS/IMS IMPLEMENTATION IN SALEM AND WINDHAM (SPW MPO)

A. DETERMINE REGIONAL FREEWAY VOC AND NOx EMISSIONS

ADT, VMT and Emissions on links from Seacoast Regional Traffic Model

	2007	2009	2017	2026	
ADT **[VOL_I]**	24,985	25,073	25,889	26,903	Average of ADT for all affected links taken from Seacoast Regional Traffic Model.
Length **[L]**	51.59	51.59	51.59	51.59	Length of affected links (in Miles) including Highway, ramps, and surface roads
VMT **[VOL_T]**	1,663,154	1,836,145	1,885,578	1,950,870	VMT from Regional Traffic Model for all impacted links
VOC [E_{BV}]	**1169.13**	**1052.11**	**552.07**	**418.20**	kg/day Area emissions from Regional Traffic Model
NOx [E_{BN}]	**2073.76**	**1896.36**	**757.15**	**397.37**	kg/day Area emissions from Regional Traffic Model
EFF*	0.75	0.75	0.75	0.75	Effectiveness of project at reducing incident related congestion*
Emissions*	0.049	0.049	0.049	0.049	% of Emissions caused by Nonrecurring congestion
E_{CVOC}	57.28746317	51.55351582	27.0514803	20.4917975	VOC Emissions due to Nonrecurring Congestion
E_{CNOx}	101.6142051	92.92146321	37.1005253	19.471246	NOx Emissions due to Nonrecurring Congestion

B. DETERMINE FREEWAY EMISSIONS DUE TO NON-RECURRING CONGESTION

Assumptions

	2007		2009		2017		2026	
	E_B	E_C	E_B	E_C	E_B	E_C	E_B	E_C
VOC	1169.131901	57.28746317	1052.11257	51.5535158	552.07103	27.05148	418.19995	20.4918
NOx	2073.759288	101.6142051	1896.35639	92.9214632	757.15358	37.100525	397.37237	19.47125

$E_C = E_B * .049$ Emissions from nonrecurring congestion is equal to the regional emissions (E_B) multiplied by the percent of emissions that are due to nonrecurring congestion. This has been determined to be 4.9% [See notes below]

C. ESTIMATE DAILY VOC/NOx REDUCTIONS

Daily Reduction VOC/NOx = $[L * VOL_I * (E_C/VOL_T) * EFF]$

YEAR	Est Emissions from model		L	VOL_I	% emissions from Incidents	E_C		VOL_T	EFF	Emissions Savings	
	VOC	NOx				VOC	NOx			**VOC**	**NOx**
2007	1169.131901	2073.759288	51.59	24,985	0.049	57.29	101.61	1,663,154	0.75	**33.30**	**59.06**
2009	1052.112568	1896.356392	49.9	25,073	0.049	51.55	92.92	1,836,145	0.75	**26.35**	**47.49**
2017	552.0710266	757.1535778	51.59	25,889	0.049	27.05	37.10	1,885,578	0.75	**14.37**	**19.71**
2026	418.1999484	397.3723668	51.59	26,903	0.049	20.49	19.47	1,950,870	0.75	**10.93**	**10.39**

8/20/2002 Air Quality Analysis Developed by David Walker using methodology from FHWA Southern Resource Center document "Off-Model Air Quality Analysis: A Compendium of Practice", page 18. http://www.fhwa.dot.gov/resourcecenters/southern/offmodel.pdf.

* Estimates of effectiveness based on implementation of Incident detection and response system that includes motorist assistance. Percent of emissions due to nonrecurring congestion and effectiveness rates taken from source listed above.

Nov-04 Updated with M6.2 emissions factors and current traffic model output.

Mar-05 Updated with most recent M6.2 emissions factors and added in 2009 analysis year.

Jul-06 Updated with most recent model output and emissions factors. Removed 2025 analysis and added 2026. Additional 1.7 miles of links added that were missed in previous iterations

APPENDIX D-6: MOBILE 6.2 (NH VEHICLE & AGE MIX) EMISSIONS FACTORS

Freeway - All Vehicle Composite Emissions Factors (in grams/mile)

	2002		2007		2009		2017		2026	
Speed	VOC	NOx	VOC	NOx	VOC	NOx	VOC	NOx	VOC	NOx
3	6.641	3.477	4.255	2.083	3.395	1.669	1.615	0.643	1.337	0.351
4	4.682	3.305	2.935	1.977	2.350	1.584	1.136	0.610	0.928	0.331
5	3.506	3.202	2.144	1.914	1.723	1.533	0.848	0.590	0.682	0.319
6	2.900	3.026	1.751	1.805	1.412	1.445	0.702	0.555	0.557	0.297
7	2.556	2.848	1.538	1.694	1.242	1.355	0.621	0.518	0.488	0.274
8	2.297	2.714	1.378	1.611	1.115	1.288	0.559	0.491	0.436	0.257
9	2.097	2.610	1.254	1.546	1.016	1.236	0.512	0.470	0.396	0.244
10	1.936	2.527	1.155	1.494	0.936	1.194	0.473	0.453	0.364	0.233
11	1.813	2.445	1.080	1.443	0.877	1.153	0.444	0.436	0.339	0.223
12	1.723	2.357	1.027	1.387	0.834	1.108	0.422	0.418	0.321	0.212
13	1.647	2.283	0.982	1.340	0.798	1.070	0.404	0.403	0.305	0.203
14	1.582	2.219	0.943	1.300	0.767	1.037	0.388	0.390	0.292	0.195
15	1.525	2.164	0.910	1.265	0.740	1.009	0.374	0.379	0.280	0.189
16	1.478	2.124	0.881	1.240	0.718	0.989	0.362	0.371	0.270	0.184
17	1.441	2.110	0.859	1.230	0.700	0.980	0.353	0.369	0.262	0.184
18	1.408	2.097	0.839	1.221	0.684	0.973	0.344	0.367	0.255	0.183
19	1.378	2.086	0.821	1.213	0.670	0.967	0.337	0.365	0.248	0.183
20	1.351	2.075	0.805	1.206	0.657	0.961	0.330	0.363	0.242	0.182
21	1.328	2.066	0.790	1.199	0.646	0.956	0.324	0.362	0.237	0.182
22	1.307	2.057	0.778	1.193	0.636	0.951	0.319	0.361	0.233	0.181
23	1.289	2.048	0.767	1.187	0.627	0.946	0.315	0.359	0.229	0.181
24	1.272	2.041	0.757	1.182	0.619	0.942	0.311	0.358	0.226	0.181
25	1.256	2.034	0.747	1.177	0.612	0.938	0.307	0.357	0.223	0.180
26	1.242	2.028	0.738	1.173	0.605	0.935	0.303	0.356	0.220	0.180
27	1.228	2.023	0.730	1.170	0.598	0.932	0.300	0.355	0.217	0.180
28	1.215	2.019	0.722	1.167	0.592	0.930	0.297	0.355	0.214	0.180
29	1.203	2.015	0.715	1.164	0.586	0.928	0.294	0.354	0.211	0.179
30	1.192	2.011	0.708	1.162	0.581	0.926	0.291	0.354	0.209	0.179
31	1.180	2.008	0.701	1.160	0.575	0.925	0.288	0.353	0.207	0.179
32	1.167	2.007	0.694	1.159	0.570	0.924	0.286	0.353	0.205	0.179
33	1.156	2.005	0.687	1.158	0.565	0.923	0.283	0.353	0.203	0.179
34	1.145	2.003	0.681	1.157	0.560	0.923	0.281	0.353	0.201	0.179
35	1.135	2.002	0.676	1.157	0.556	0.922	0.279	0.353	0.199	0.178
36	1.128	2.009	0.671	1.161	0.552	0.926	0.277	0.354	0.197	0.179
37	1.121	2.015	0.667	1.166	0.549	0.930	0.276	0.356	0.196	0.180
38	1.114	2.020	0.663	1.170	0.545	0.933	0.274	0.357	0.195	0.181
39	1.108	2.026	0.659	1.174	0.542	0.937	0.273	0.358	0.193	0.182
40	1.102	2.035	0.655	1.180	0.540	0.942	0.271	0.360	0.192	0.183
41	1.096	2.047	0.651	1.189	0.537	0.949	0.270	0.363	0.191	0.184
42	1.090	2.058	0.648	1.197	0.534	0.956	0.269	0.366	0.190	0.185
43	1.085	2.069	0.645	1.205	0.531	0.962	0.268	0.368	0.189	0.186
44	1.080	2.080	0.641	1.213	0.529	0.968	0.267	0.370	0.188	0.188
45	1.074	2.099	0.638	1.226	0.526	0.979	0.265	0.374	0.187	0.189
46	1.069	2.116	0.635	1.239	0.524	0.989	0.264	0.378	0.186	0.191
47	1.064	2.133	0.632	1.251	0.521	0.999	0.263	0.382	0.185	0.193
48	1.059	2.149	0.628	1.262	0.519	1.009	0.263	0.385	0.185	0.194
49	1.054	2.172	0.625	1.279	0.517	1.022	0.262	0.390	0.184	0.196
50	1.049	2.198	0.622	1.297	0.515	1.037	0.261	0.395	0.183	0.199
51	1.044	2.222	0.620	1.315	0.513	1.052	0.260	0.400	0.183	0.201
52	1.040	2.246	0.617	1.332	0.511	1.065	0.260	0.405	0.182	0.203
53	1.036	2.276	0.615	1.353	0.509	1.083	0.259	0.411	0.182	0.206
54	1.033	2.312	0.613	1.379	0.508	1.104	0.259	0.418	0.182	0.209
55	1.029	2.347	0.611	1.404	0.506	1.125	0.259	0.426	0.182	0.212
56	1.026	2.381	0.609	1.428	0.505	1.144	0.259	0.432	0.182	0.215
57	1.023	2.421	0.607	1.457	0.504	1.167	0.259	0.440	0.182	0.218
58	1.021	2.473	0.606	1.494	0.503	1.198	0.259	0.451	0.183	0.222
59	1.018	2.523	0.605	1.530	0.502	1.227	0.259	0.460	0.183	0.226
60	1.015	2.571	0.603	1.565	0.502	1.255	0.260	0.470	0.183	0.230
60.7	1.014	2.604	0.602	1.588	0.501	1.275	0.260	0.477	0.183	0.233

Arterial - All Vehicle Composite Emissions Factors (in grams/mile)

	2002		2007		2009		2017		2026	
Speed	VOC	NOx	VOC	NOx	VOC	NOx	VOC	NOx	VOC	NOx
2.5	8.053	3.524	5.197	2.156	4.142	1.735	1.961	0.671	1.633	0.374
3	6.485	3.386	4.142	2.071	3.306	1.667	1.577	0.645	1.305	0.358
4	4.525	3.214	2.822	1.965	2.261	1.582	1.099	0.612	0.896	0.338
5	3.349	3.111	2.031	1.902	1.634	1.531	0.811	0.592	0.650	0.326
6	2.888	2.932	1.744	1.789	1.407	1.440	0.702	0.557	0.558	0.305
7	2.558	2.804	1.539	1.709	1.244	1.375	0.625	0.531	0.492	0.290
8	2.311	2.708	1.385	1.649	1.122	1.327	0.566	0.512	0.442	0.278
9	2.119	2.634	1.266	1.602	1.027	1.289	0.521	0.497	0.404	0.269
10	1.965	2.574	1.170	1.565	0.951	1.259	0.485	0.485	0.373	0.262
11	1.861	2.482	1.108	1.506	0.902	1.211	0.460	0.467	0.352	0.251
12	1.774	2.405	1.057	1.458	0.860	1.172	0.439	0.452	0.334	0.242
13	1.700	2.340	1.013	1.416	0.826	1.139	0.421	0.439	0.319	0.235
14	1.637	2.285	0.976	1.381	0.796	1.110	0.406	0.428	0.306	0.228
15	1.582	2.237	0.943	1.351	0.770	1.086	0.392	0.418	0.295	0.222
16	1.530	2.189	0.912	1.320	0.745	1.061	0.379	0.409	0.284	0.217
17	1.484	2.148	0.885	1.294	0.723	1.040	0.367	0.401	0.274	0.212
18	1.443	2.111	0.860	1.270	0.703	1.021	0.357	0.393	0.265	0.208
19	1.407	2.078	0.839	1.249	0.686	1.004	0.347	0.387	0.257	0.204
20	1.374	2.048	0.819	1.230	0.670	0.988	0.339	0.381	0.249	0.201
21	1.346	2.021	0.802	1.212	0.657	0.974	0.332	0.376	0.244	0.198
22	1.320	1.996	0.787	1.197	0.645	0.961	0.326	0.371	0.239	0.195
23	1.297	1.973	0.773	1.182	0.634	0.950	0.320	0.366	0.234	0.193
24	1.276	1.952	0.761	1.169	0.624	0.939	0.315	0.362	0.230	0.190
25	1.256	1.933	0.749	1.156	0.614	0.929	0.310	0.358	0.226	0.188
26	1.239	1.917	0.739	1.146	0.606	0.921	0.306	0.355	0.222	0.186
27	1.223	1.902	0.729	1.137	0.598	0.913	0.302	0.352	0.218	0.185
28	1.209	1.888	0.720	1.128	0.591	0.906	0.298	0.350	0.215	0.183
29	1.195	1.875	0.712	1.120	0.585	0.900	0.295	0.347	0.212	0.182
30	1.182	1.863	0.705	1.113	0.579	0.894	0.291	0.345	0.209	0.180
31	1.169	1.858	0.697	1.109	0.573	0.891	0.288	0.344	0.207	0.179
32	1.156	1.852	0.690	1.106	0.567	0.888	0.285	0.343	0.204	0.179
33	1.144	1.847	0.683	1.103	0.562	0.886	0.283	0.342	0.202	0.178
34	1.133	1.842	0.677	1.100	0.557	0.884	0.280	0.341	0.200	0.177
35	1.122	1.838	0.671	1.097	0.552	0.882	0.278	0.340	0.198	0.177
36	1.115	1.844	0.666	1.102	0.548	0.885	0.276	0.341	0.197	0.177
37	1.108	1.850	0.662	1.107	0.545	0.889	0.275	0.343	0.195	0.178
38	1.102	1.856	0.658	1.111	0.542	0.893	0.273	0.344	0.194	0.179
39	1.095	1.861	0.654	1.115	0.539	0.896	0.272	0.346	0.193	0.180
40	1.090	1.867	0.650	1.119	0.536	0.899	0.270	0.347	0.191	0.180
41	1.084	1.879	0.646	1.127	0.533	0.906	0.269	0.350	0.190	0.182
42	1.078	1.890	0.643	1.135	0.530	0.913	0.268	0.352	0.189	0.183
43	1.072	1.901	0.640	1.143	0.528	0.919	0.267	0.355	0.188	0.184
44	1.067	1.912	0.636	1.151	0.525	0.925	0.265	0.357	0.187	0.185
45	1.062	1.922	0.633	1.158	0.523	0.931	0.264	0.359	0.186	0.186
46	1.057	1.939	0.630	1.170	0.521	0.941	0.263	0.363	0.185	0.188
47	1.052	1.956	0.627	1.182	0.518	0.951	0.262	0.366	0.185	0.190
48	1.047	1.972	0.624	1.194	0.516	0.961	0.261	0.370	0.184	0.191
49	1.042	1.988	0.621	1.205	0.514	0.970	0.260	0.373	0.183	0.193
50	1.038	2.002	0.618	1.216	0.511	0.978	0.260	0.376	0.182	0.194
51	1.033	2.027	0.615	1.233	0.509	0.993	0.259	0.381	0.182	0.196
52	1.029	2.050	0.613	1.250	0.507	1.006	0.258	0.386	0.181	0.199
53	1.024	2.073	0.610	1.266	0.505	1.020	0.258	0.391	0.181	0.201
54	1.020	2.095	0.608	1.282	0.503	1.033	0.257	0.395	0.180	0.203
55	1.016	2.116	0.605	1.297	0.502	1.045	0.256	0.400	0.180	0.205
56	1.013	2.150	0.603	1.321	0.500	1.065	0.256	0.406	0.180	0.208
57	1.010	2.183	0.602	1.345	0.499	1.084	0.256	0.413	0.180	0.210
58	1.007	2.214	0.600	1.367	0.498	1.102	0.256	0.419	0.180	0.213
59	1.004	2.245	0.598	1.389	0.497	1.120	0.256	0.426	0.180	0.216
60	1.002	2.274	0.597	1.410	0.496	1.137	0.256	0.431	0.180	0.218
61	0.999	2.321	0.596	1.444	0.495	1.164	0.256	0.441	0.180	0.222
62	0.997	2.366	0.594	1.476	0.495	1.191	0.256	0.450	0.180	0.226
63	0.995	2.410	0.593	1.508	0.494	1.217	0.256	0.458	0.181	0.229
64	0.992	2.453	0.592	1.538	0.493	1.242	0.257	0.467	0.181	0.233
65	0.990	2.494	0.591	1.568	0.492	1.266	0.257	0.475	0.181	0.236

Freeway - Light Duty Vehicle Emissions Factors (in grams/mile)

	2002		2007		2009		2017		2026	
Speed	VOC	NOx	VOC	NOx	VOC	NOx	VOC	NOx	VOC	NOx
3	6.780	2.284	4.309	1.289	3.398	1.033	1.556	0.417	1.306	0.273
4	4.714	2.146	2.928	1.210	2.317	0.970	1.070	0.391	0.884	0.256
5	3.475	2.063	2.099	1.163	1.669	0.933	0.778	0.377	0.631	0.246
6	2.849	1.915	1.696	1.077	1.353	0.863	0.635	0.348	0.507	0.226
7	2.501	1.763	1.482	0.988	1.184	0.792	0.556	0.318	0.440	0.205
8	2.241	1.649	1.323	0.921	1.058	0.738	0.499	0.295	0.390	0.190
9	2.038	1.559	1.198	0.870	0.961	0.696	0.453	0.278	0.351	0.178
10	1.876	1.489	1.098	0.828	0.882	0.662	0.417	0.264	0.320	0.168
11	1.754	1.421	1.025	0.789	0.825	0.631	0.390	0.251	0.297	0.159
12	1.669	1.353	0.976	0.749	0.785	0.598	0.371	0.238	0.281	0.150
13	1.597	1.295	0.933	0.715	0.752	0.571	0.355	0.226	0.267	0.142
14	1.535	1.245	0.898	0.686	0.723	0.548	0.341	0.216	0.255	0.135
15	1.481	1.202	0.866	0.660	0.698	0.527	0.329	0.208	0.245	0.129
16	1.436	1.175	0.840	0.645	0.677	0.515	0.319	0.203	0.236	0.126
17	1.403	1.176	0.820	0.646	0.662	0.516	0.311	0.203	0.229	0.126
18	1.374	1.177	0.803	0.647	0.648	0.517	0.304	0.204	0.223	0.126
19	1.347	1.179	0.787	0.648	0.636	0.518	0.298	0.204	0.218	0.127
20	1.323	1.179	0.772	0.649	0.625	0.519	0.292	0.205	0.213	0.127
21	1.303	1.179	0.760	0.650	0.615	0.520	0.288	0.205	0.209	0.128
22	1.286	1.180	0.749	0.650	0.607	0.520	0.284	0.205	0.205	0.128
23	1.270	1.180	0.740	0.650	0.600	0.520	0.281	0.206	0.202	0.127
24	1.255	1.180	0.732	0.651	0.593	0.520	0.278	0.206	0.200	0.128
25	1.242	1.179	0.724	0.651	0.586	0.520	0.275	0.206	0.198	0.128
26	1.229	1.179	0.716	0.651	0.581	0.521	0.273	0.206	0.195	0.128
27	1.217	1.179	0.709	0.651	0.576	0.521	0.270	0.206	0.193	0.128
28	1.207	1.179	0.703	0.651	0.570	0.521	0.267	0.206	0.191	0.128
29	1.196	1.178	0.697	0.651	0.566	0.521	0.265	0.207	0.189	0.128
30	1.186	1.178	0.691	0.651	0.561	0.521	0.263	0.207	0.187	0.128
31	1.176	1.176	0.685	0.650	0.557	0.520	0.262	0.207	0.186	0.128
32	1.165	1.174	0.679	0.650	0.553	0.520	0.260	0.206	0.184	0.127
33	1.155	1.172	0.674	0.649	0.548	0.519	0.258	0.206	0.182	0.127
34	1.146	1.171	0.668	0.648	0.544	0.518	0.256	0.205	0.181	0.127
35	1.136	1.170	0.664	0.647	0.540	0.518	0.255	0.205	0.180	0.127
36	1.130	1.172	0.660	0.648	0.537	0.520	0.253	0.206	0.179	0.127
37	1.124	1.174	0.656	0.651	0.534	0.521	0.252	0.207	0.178	0.128
38	1.118	1.176	0.652	0.652	0.532	0.522	0.251	0.208	0.176	0.129
39	1.113	1.178	0.649	0.654	0.530	0.524	0.250	0.208	0.176	0.129
40	1.108	1.181	0.646	0.656	0.527	0.525	0.249	0.209	0.175	0.130
41	1.103	1.185	0.643	0.659	0.525	0.527	0.248	0.210	0.174	0.130
42	1.097	1.188	0.640	0.661	0.522	0.529	0.247	0.211	0.173	0.131
43	1.092	1.191	0.637	0.663	0.520	0.532	0.246	0.212	0.172	0.132
44	1.088	1.195	0.634	0.666	0.518	0.533	0.245	0.213	0.171	0.132
45	1.083	1.199	0.631	0.668	0.516	0.535	0.245	0.214	0.171	0.133
46	1.078	1.203	0.628	0.671	0.514	0.538	0.244	0.215	0.170	0.133
47	1.073	1.207	0.625	0.673	0.512	0.540	0.244	0.216	0.170	0.134
48	1.069	1.210	0.622	0.676	0.509	0.542	0.243	0.217	0.169	0.135
49	1.064	1.214	0.620	0.679	0.508	0.545	0.242	0.218	0.168	0.136
50	1.059	1.218	0.616	0.682	0.505	0.547	0.241	0.219	0.168	0.137
51	1.055	1.222	0.614	0.684	0.503	0.549	0.241	0.220	0.167	0.137
52	1.050	1.226	0.611	0.687	0.502	0.551	0.240	0.221	0.167	0.138
53	1.046	1.231	0.609	0.689	0.500	0.553	0.240	0.222	0.167	0.138
54	1.043	1.235	0.606	0.693	0.498	0.556	0.239	0.223	0.166	0.139
55	1.039	1.239	0.604	0.695	0.497	0.559	0.239	0.225	0.166	0.140
56	1.035	1.243	0.602	0.698	0.495	0.561	0.239	0.226	0.166	0.140
57	1.032	1.247	0.600	0.701	0.494	0.563	0.239	0.226	0.165	0.141
58	1.029	1.252	0.598	0.705	0.492	0.566	0.238	0.227	0.165	0.142
59	1.026	1.256	0.597	0.707	0.491	0.568	0.238	0.229	0.165	0.143
60	1.022	1.261	0.595	0.710	0.490	0.571	0.238	0.230	0.165	0.143
60.7	1.020	1.264	0.593	0.712	0.489	0.573	0.238	0.231	0.165	0.143

Arterial - Light Duty Vehicle Emissions Factors (in grams/mile)

	2002		2007		2009		2017		2026	
Speed	VOC	NOx	VOC	NOx	VOC	NOx	VOC	NOx	VOC	NOx
2.5	8.253	2.425	5.287	1.372	4.164	1.101	1.902	0.445	1.607	0.293
3	6.601	2.315	4.181	1.310	3.299	1.050	1.513	0.425	1.269	0.279
4	4.535	2.176	2.800	1.231	2.218	0.988	1.027	0.400	0.847	0.262
5	3.295	2.094	1.972	1.184	1.570	0.950	0.736	0.385	0.594	0.252
6	2.831	1.957	1.685	1.105	1.345	0.887	0.633	0.359	0.506	0.233
7	2.499	1.860	1.480	1.049	1.185	0.842	0.560	0.340	0.442	0.220
8	2.250	1.786	1.326	1.007	1.063	0.808	0.504	0.326	0.395	0.211
9	2.056	1.729	1.207	0.974	0.970	0.782	0.462	0.315	0.358	0.203
10	1.901	1.683	1.111	0.948	0.895	0.761	0.428	0.307	0.329	0.197
11	1.803	1.616	1.054	0.908	0.849	0.729	0.406	0.294	0.310	0.188
12	1.721	1.559	1.006	0.876	0.811	0.702	0.387	0.283	0.295	0.181
13	1.651	1.512	0.965	0.848	0.779	0.680	0.371	0.273	0.281	0.174
14	1.591	1.470	0.930	0.824	0.752	0.661	0.359	0.266	0.270	0.169
15	1.539	1.435	0.900	0.803	0.728	0.644	0.347	0.258	0.260	0.164
16	1.491	1.403	0.872	0.785	0.705	0.629	0.336	0.252	0.250	0.160
17	1.449	1.375	0.847	0.769	0.685	0.616	0.326	0.247	0.241	0.156
18	1.411	1.350	0.825	0.754	0.668	0.605	0.317	0.242	0.233	0.152
19	1.378	1.327	0.805	0.741	0.652	0.594	0.309	0.238	0.226	0.149
20	1.347	1.307	0.787	0.729	0.638	0.585	0.302	0.234	0.220	0.147
21	1.322	1.288	0.773	0.719	0.626	0.576	0.296	0.230	0.215	0.144
22	1.299	1.271	0.759	0.709	0.616	0.568	0.291	0.227	0.211	0.142
23	1.278	1.256	0.747	0.700	0.606	0.561	0.286	0.224	0.207	0.140
24	1.259	1.241	0.736	0.692	0.597	0.554	0.282	0.221	0.204	0.138
25	1.241	1.229	0.726	0.684	0.589	0.548	0.279	0.219	0.200	0.136
26	1.226	1.216	0.717	0.677	0.582	0.542	0.275	0.216	0.198	0.135
27	1.212	1.205	0.709	0.670	0.576	0.537	0.272	0.214	0.195	0.133
28	1.200	1.194	0.701	0.664	0.570	0.532	0.269	0.212	0.192	0.132
29	1.188	1.184	0.694	0.658	0.565	0.528	0.266	0.210	0.190	0.131
30	1.176	1.174	0.687	0.653	0.559	0.523	0.264	0.209	0.188	0.129
31	1.164	1.168	0.681	0.649	0.554	0.520	0.261	0.207	0.186	0.129
32	1.153	1.163	0.674	0.646	0.549	0.518	0.259	0.206	0.184	0.128
33	1.142	1.157	0.668	0.643	0.545	0.515	0.257	0.205	0.182	0.127
34	1.132	1.151	0.663	0.640	0.540	0.513	0.255	0.204	0.180	0.126
35	1.122	1.147	0.658	0.637	0.536	0.510	0.253	0.203	0.179	0.125
36	1.117	1.149	0.654	0.639	0.533	0.512	0.252	0.204	0.178	0.125
37	1.110	1.151	0.650	0.640	0.530	0.514	0.251	0.205	0.177	0.126
38	1.105	1.154	0.647	0.642	0.528	0.515	0.250	0.205	0.175	0.127
39	1.100	1.156	0.644	0.643	0.525	0.516	0.249	0.206	0.175	0.127
40	1.095	1.158	0.641	0.645	0.523	0.518	0.248	0.207	0.174	0.128
41	1.089	1.162	0.637	0.648	0.521	0.520	0.247	0.207	0.173	0.129
42	1.084	1.165	0.635	0.650	0.519	0.521	0.246	0.208	0.172	0.129
43	1.079	1.168	0.632	0.653	0.516	0.523	0.245	0.209	0.171	0.130
44	1.075	1.171	0.629	0.654	0.514	0.525	0.244	0.210	0.171	0.130
45	1.070	1.175	0.626	0.657	0.512	0.527	0.244	0.211	0.170	0.131
46	1.066	1.178	0.623	0.659	0.510	0.529	0.243	0.212	0.170	0.132
47	1.061	1.182	0.620	0.662	0.508	0.532	0.242	0.213	0.169	0.132
48	1.056	1.186	0.618	0.664	0.506	0.533	0.241	0.214	0.168	0.133
49	1.051	1.189	0.615	0.667	0.504	0.535	0.241	0.215	0.167	0.133
50	1.047	1.192	0.613	0.669	0.502	0.537	0.240	0.216	0.167	0.134
51	1.043	1.196	0.610	0.672	0.500	0.540	0.240	0.217	0.166	0.135
52	1.039	1.200	0.607	0.675	0.498	0.542	0.239	0.218	0.166	0.136
53	1.035	1.204	0.604	0.677	0.496	0.544	0.238	0.219	0.166	0.136
54	1.031	1.207	0.602	0.679	0.495	0.546	0.238	0.220	0.165	0.137
55	1.027	1.211	0.599	0.682	0.493	0.548	0.237	0.221	0.165	0.137
56	1.023	1.215	0.597	0.684	0.491	0.550	0.237	0.222	0.164	0.138
57	1.020	1.219	0.596	0.687	0.490	0.553	0.237	0.223	0.164	0.139
58	1.016	1.223	0.594	0.690	0.488	0.554	0.237	0.224	0.164	0.139
59	1.013	1.227	0.591	0.692	0.487	0.557	0.236	0.225	0.164	0.140
60	1.010	1.231	0.590	0.695	0.486	0.559	0.236	0.226	0.164	0.140
61	1.007	1.234	0.588	0.697	0.485	0.561	0.236	0.226	0.163	0.141
62	1.004	1.239	0.587	0.700	0.483	0.563	0.236	0.228	0.163	0.142
63	1.001	1.243	0.585	0.703	0.482	0.566	0.235	0.229	0.163	0.142
64	0.999	1.246	0.583	0.705	0.482	0.568	0.235	0.230	0.163	0.143
65	0.996	1.250	0.582	0.708	0.480	0.570	0.235	0.231	0.163	0.144

Freeway - Urban Bus Emissions Factors (in grams/mile)

	2002		2007		2009		2017		2026	
Speed	VOC	NOx	VOC	NOx	VOC	NOx	VOC	NOx	VOC	NOx
3	2.506	31.744	1.465	23.692	1.172	20.324	0.720	7.978	0.673	2.595
4	2.369	30.320	1.385	22.617	1.108	19.401	0.681	7.614	0.636	2.477
5	2.286	29.466	1.336	21.972	1.069	18.847	0.657	7.395	0.614	2.406
6	2.163	28.216	1.264	21.028	1.011	18.037	0.621	7.076	0.581	2.302
7	2.040	26.985	1.193	20.099	0.954	17.239	0.586	6.761	0.548	2.200
8	1.949	26.061	1.139	19.402	0.911	16.640	0.560	6.525	0.523	2.123
9	1.877	25.343	1.097	18.860	0.878	16.175	0.539	6.341	0.504	2.064
10	1.820	24.769	1.064	18.426	0.851	15.802	0.523	6.194	0.489	2.016
11	1.753	24.114	1.025	17.931	0.820	15.378	0.504	6.026	0.471	1.962
12	1.669	23.310	0.975	17.325	0.780	14.857	0.479	5.821	0.448	1.895
13	1.597	22.630	0.934	16.812	0.747	14.416	0.459	5.647	0.429	1.839
14	1.536	22.048	0.898	16.372	0.718	14.038	0.441	5.498	0.413	1.790
15	1.483	21.543	0.867	15.990	0.693	13.711	0.426	5.369	0.398	1.748
16	1.431	21.060	0.836	15.626	0.669	13.398	0.411	5.246	0.384	1.708
17	1.371	20.538	0.802	15.232	0.641	13.059	0.394	5.112	0.368	1.665
18	1.318	20.074	0.770	14.881	0.616	12.759	0.379	4.993	0.354	1.627
19	1.271	19.658	0.743	14.568	0.594	12.490	0.365	4.887	0.341	1.592
20	1.228	19.285	0.718	14.286	0.574	12.247	0.353	4.792	0.330	1.561
21	1.187	18.942	0.694	14.027	0.555	12.025	0.341	4.704	0.319	1.533
22	1.143	18.620	0.668	13.784	0.535	11.816	0.329	4.622	0.307	1.506
23	1.104	18.326	0.645	13.562	0.516	11.626	0.317	4.547	0.297	1.482
24	1.068	18.057	0.624	13.359	0.499	11.451	0.307	4.478	0.287	1.459
25	1.035	17.809	0.605	13.172	0.484	11.291	0.297	4.414	0.278	1.439
26	1.002	17.601	0.586	13.015	0.469	11.156	0.288	4.361	0.269	1.421
27	0.971	17.435	0.567	12.889	0.454	11.048	0.279	4.319	0.261	1.408
28	0.941	17.280	0.550	12.773	0.440	10.948	0.271	4.279	0.253	1.395
29	0.914	17.136	0.534	12.664	0.427	10.855	0.263	4.242	0.246	1.383
30	0.889	17.002	0.519	12.563	0.415	10.767	0.255	4.208	0.239	1.372
31	0.864	16.937	0.505	12.513	0.404	10.725	0.248	4.191	0.232	1.366
32	0.841	16.904	0.491	12.488	0.393	10.704	0.242	4.183	0.226	1.363
33	0.819	16.873	0.479	12.465	0.383	10.684	0.235	4.175	0.220	1.361
34	0.798	16.843	0.467	12.443	0.373	10.665	0.229	4.167	0.214	1.358
35	0.779	16.820	0.455	12.425	0.364	10.649	0.224	4.161	0.209	1.357
36	0.761	16.919	0.445	12.500	0.356	10.714	0.219	4.187	0.204	1.365
37	0.744	17.014	0.435	12.571	0.348	10.775	0.214	4.211	0.200	1.373
38	0.728	17.103	0.425	12.639	0.340	10.833	0.209	4.234	0.196	1.380
39	0.712	17.188	0.416	12.703	0.333	10.888	0.205	4.255	0.191	1.387
40	0.698	17.353	0.408	12.827	0.326	10.995	0.201	4.298	0.188	1.401
41	0.685	17.595	0.401	13.010	0.320	11.152	0.197	4.360	0.184	1.421
42	0.673	17.825	0.393	13.184	0.315	11.301	0.193	4.419	0.181	1.440
43	0.661	18.045	0.387	13.350	0.309	11.444	0.190	4.475	0.178	1.458
44	0.650	18.268	0.380	13.518	0.304	11.588	0.187	4.532	0.175	1.477
45	0.641	18.696	0.375	13.841	0.300	11.865	0.184	4.641	0.172	1.512
46	0.632	19.104	0.370	14.150	0.296	12.130	0.182	4.746	0.170	1.546
47	0.624	19.496	0.365	14.445	0.292	12.384	0.179	4.846	0.168	1.579
48	0.616	19.871	0.360	14.728	0.288	12.627	0.177	4.942	0.165	1.610
49	0.609	20.455	0.356	15.169	0.285	13.006	0.175	5.091	0.164	1.658
50	0.603	21.102	0.353	15.658	0.282	13.425	0.173	5.256	0.162	1.712
51	0.598	21.723	0.349	16.127	0.279	13.828	0.172	5.415	0.161	1.763
52	0.592	22.321	0.346	16.578	0.277	14.215	0.170	5.568	0.159	1.813
53	0.588	23.104	0.344	17.169	0.275	14.723	0.169	5.768	0.158	1.878
54	0.585	24.083	0.342	17.909	0.274	15.358	0.168	6.019	0.157	1.959
55	0.583	25.027	0.341	18.621	0.272	15.970	0.167	6.260	0.157	2.038
56	0.580	25.937	0.339	19.308	0.271	16.560	0.167	6.493	0.156	2.113
57	0.578	27.021	0.338	20.126	0.270	17.262	0.166	6.770	0.155	2.203
58	0.578	28.483	0.338	21.230	0.270	18.210	0.166	7.144	0.155	2.324
59	0.578	29.896	0.338	22.296	0.270	19.126	0.166	7.505	0.155	2.441
60	0.578	31.261	0.338	23.327	0.270	20.011	0.166	7.854	0.155	2.555
60.7	0.578	32.190	0.338	24.028	0.270	20.613	0.166	8.092	0.155	2.632

Arterial - Urban Bus Emissions Factors (in grams/mile)

	2002		2007		2009		2017		2026	
Speed	VOC	NOx	VOC	NOx	VOC	NOx	VOC	NOx	VOC	NOx
2.5	2.722	33.726	1.591	25.164	1.273	21.587	0.782	8.472	0.731	2.756
3	2.612	32.587	1.527	24.304	1.221	20.848	0.751	8.181	0.702	2.661
4	2.475	31.163	1.447	23.229	1.157	19.925	0.711	7.817	0.665	2.543
5	2.392	30.309	1.398	22.584	1.118	19.371	0.687	7.598	0.643	2.472
6	2.221	28.585	1.298	21.283	1.038	18.254	0.638	7.158	0.597	2.329
7	2.098	27.354	1.227	20.354	0.981	17.456	0.603	6.843	0.564	2.227
8	2.007	26.430	1.173	19.656	0.938	16.857	0.577	6.607	0.539	2.151
9	1.935	25.712	1.131	19.114	0.905	16.392	0.556	6.423	0.520	2.091
10	1.878	25.137	1.098	18.681	0.878	16.019	0.540	6.276	0.505	2.043
11	1.777	24.173	1.039	17.953	0.831	15.394	0.511	6.030	0.477	1.963
12	1.693	23.370	0.989	17.346	0.791	14.873	0.486	5.824	0.455	1.897
13	1.621	22.690	0.948	16.833	0.758	14.433	0.466	5.650	0.436	1.840
14	1.560	22.107	0.912	16.393	0.729	14.055	0.448	5.501	0.419	1.792
15	1.507	21.602	0.881	16.012	0.705	13.728	0.433	5.372	0.405	1.750
16	1.439	21.011	0.841	15.565	0.673	13.344	0.414	5.221	0.387	1.701
17	1.380	20.489	0.807	15.171	0.645	13.006	0.396	5.087	0.371	1.658
18	1.327	20.025	0.776	14.821	0.620	12.705	0.381	4.969	0.356	1.619
19	1.279	19.610	0.748	14.507	0.598	12.436	0.368	4.863	0.344	1.585
20	1.236	19.236	0.723	14.225	0.578	12.194	0.355	4.767	0.332	1.554
21	1.189	18.882	0.695	13.958	0.556	11.964	0.342	4.677	0.319	1.524
22	1.146	18.560	0.670	13.715	0.536	11.755	0.329	4.594	0.308	1.498
23	1.106	18.266	0.647	13.493	0.517	11.565	0.318	4.519	0.297	1.473
24	1.070	17.997	0.626	13.290	0.500	11.390	0.308	4.450	0.288	1.451
25	1.037	17.749	0.606	13.103	0.485	11.230	0.298	4.387	0.279	1.430
26	1.003	17.569	0.586	12.967	0.469	11.113	0.288	4.341	0.269	1.415
27	0.971	17.403	0.568	12.841	0.454	11.005	0.279	4.298	0.261	1.402
28	0.942	17.248	0.550	12.725	0.440	10.905	0.271	4.259	0.253	1.389
29	0.914	17.104	0.535	12.616	0.428	10.812	0.263	4.222	0.246	1.377
30	0.889	16.970	0.520	12.515	0.416	10.725	0.255	4.188	0.239	1.366
31	0.864	16.935	0.505	12.488	0.404	10.702	0.248	4.179	0.232	1.363
32	0.841	16.902	0.491	12.463	0.393	10.680	0.242	4.170	0.226	1.360
33	0.819	16.870	0.479	12.439	0.383	10.660	0.235	4.162	0.220	1.357
34	0.798	16.841	0.467	12.417	0.373	10.641	0.229	4.155	0.214	1.355
35	0.779	16.813	0.455	12.396	0.364	10.623	0.224	4.148	0.209	1.353
36	0.761	16.913	0.445	12.472	0.356	10.688	0.219	4.173	0.204	1.361
37	0.744	17.007	0.435	12.543	0.348	10.749	0.214	4.197	0.200	1.369
38	0.728	17.097	0.425	12.610	0.340	10.807	0.209	4.220	0.196	1.376
39	0.712	17.181	0.416	12.674	0.333	10.862	0.205	4.242	0.191	1.383
40	0.698	17.262	0.408	12.735	0.326	10.914	0.201	4.262	0.187	1.390
41	0.685	17.504	0.400	12.918	0.320	11.071	0.197	4.324	0.184	1.410
42	0.673	17.734	0.393	13.092	0.314	11.220	0.193	4.383	0.181	1.429
43	0.661	17.954	0.386	13.258	0.309	11.363	0.190	4.439	0.178	1.447
44	0.650	18.164	0.380	13.416	0.304	11.499	0.187	4.493	0.175	1.465
45	0.639	18.364	0.374	13.567	0.299	11.629	0.184	4.544	0.172	1.481
46	0.630	18.773	0.368	13.876	0.295	11.894	0.181	4.649	0.169	1.515
47	0.622	19.165	0.363	14.171	0.291	12.147	0.179	4.749	0.167	1.548
48	0.614	19.540	0.359	14.455	0.287	12.390	0.176	4.845	0.165	1.579
49	0.606	19.900	0.354	14.726	0.283	12.624	0.174	4.937	0.163	1.609
50	0.598	20.245	0.350	14.987	0.280	12.848	0.172	5.025	0.161	1.637
51	0.593	20.866	0.346	15.456	0.277	13.250	0.170	5.184	0.159	1.689
52	0.587	21.464	0.343	15.907	0.275	13.638	0.169	5.337	0.158	1.738
53	0.582	22.039	0.340	16.341	0.272	14.010	0.167	5.484	0.156	1.786
54	0.577	22.592	0.337	16.759	0.270	14.369	0.166	5.625	0.155	1.832
55	0.572	23.126	0.335	17.162	0.268	14.715	0.164	5.762	0.154	1.876
56	0.570	24.036	0.333	17.849	0.266	15.305	0.164	5.994	0.153	1.952
57	0.567	24.914	0.332	18.511	0.265	15.874	0.163	6.219	0.152	2.025
58	0.565	25.761	0.330	19.151	0.264	16.424	0.162	6.436	0.152	2.095
59	0.562	26.580	0.329	19.770	0.263	16.954	0.162	6.645	0.151	2.163
60	0.560	27.372	0.327	20.367	0.262	17.468	0.161	6.847	0.150	2.229
61	0.560	28.692	0.327	21.364	0.262	18.324	0.161	7.185	0.150	2.338
62	0.560	29.970	0.327	22.329	0.262	19.152	0.161	7.512	0.150	2.444
63	0.560	31.208	0.327	23.263	0.262	19.954	0.161	7.828	0.150	2.547
64	0.560	32.406	0.327	24.168	0.262	20.731	0.161	8.135	0.150	2.646
65	0.560	33.568	0.327	25.045	0.262	21.484	0.161	8.432	0.150	2.743

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